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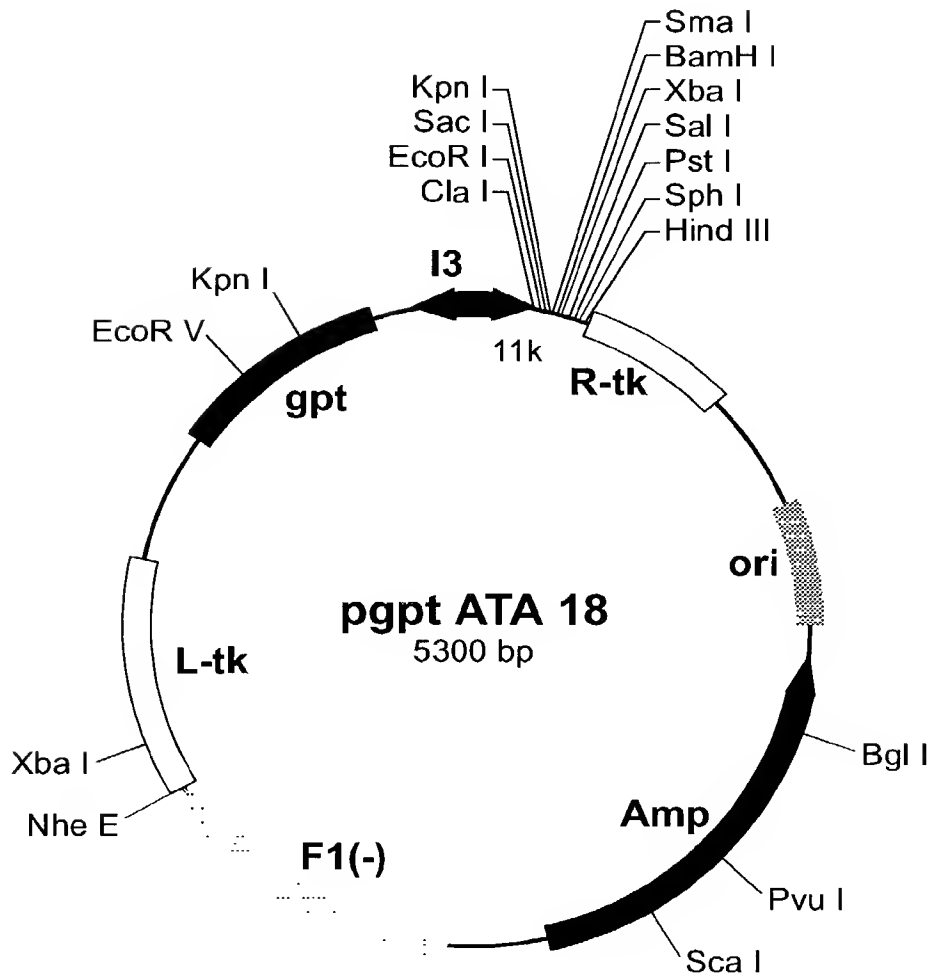


Figure 1



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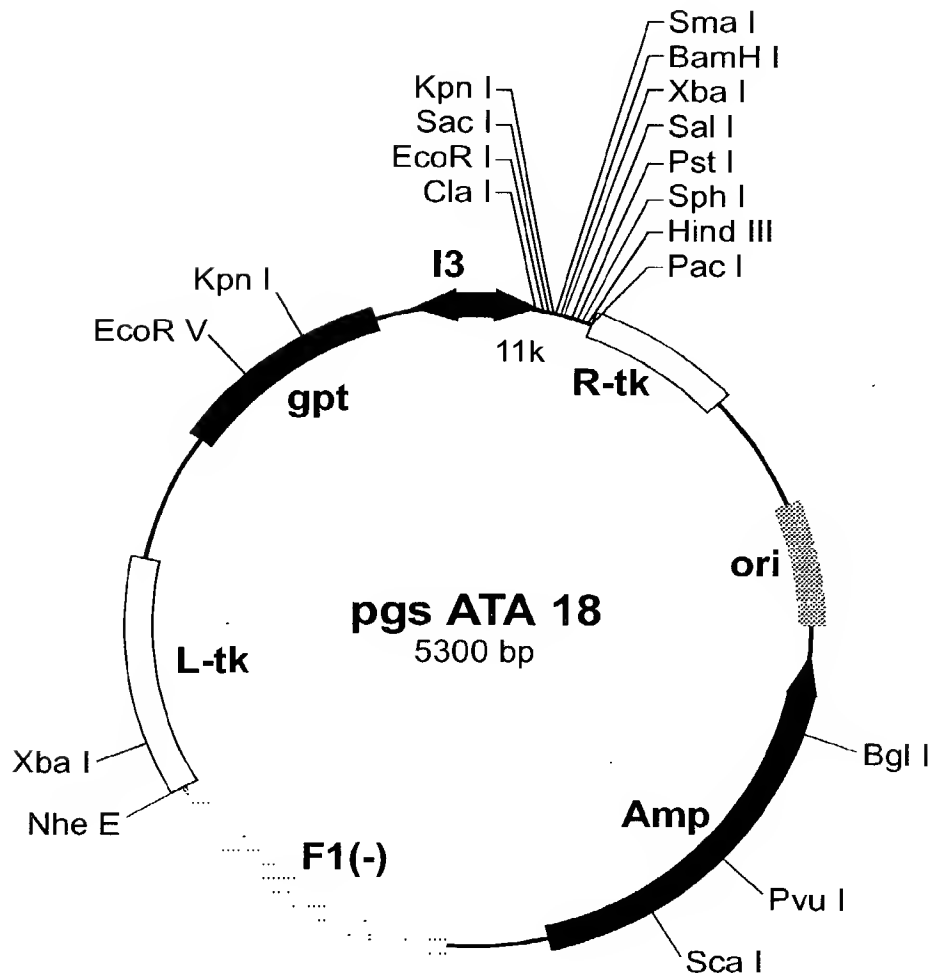


Figure 2



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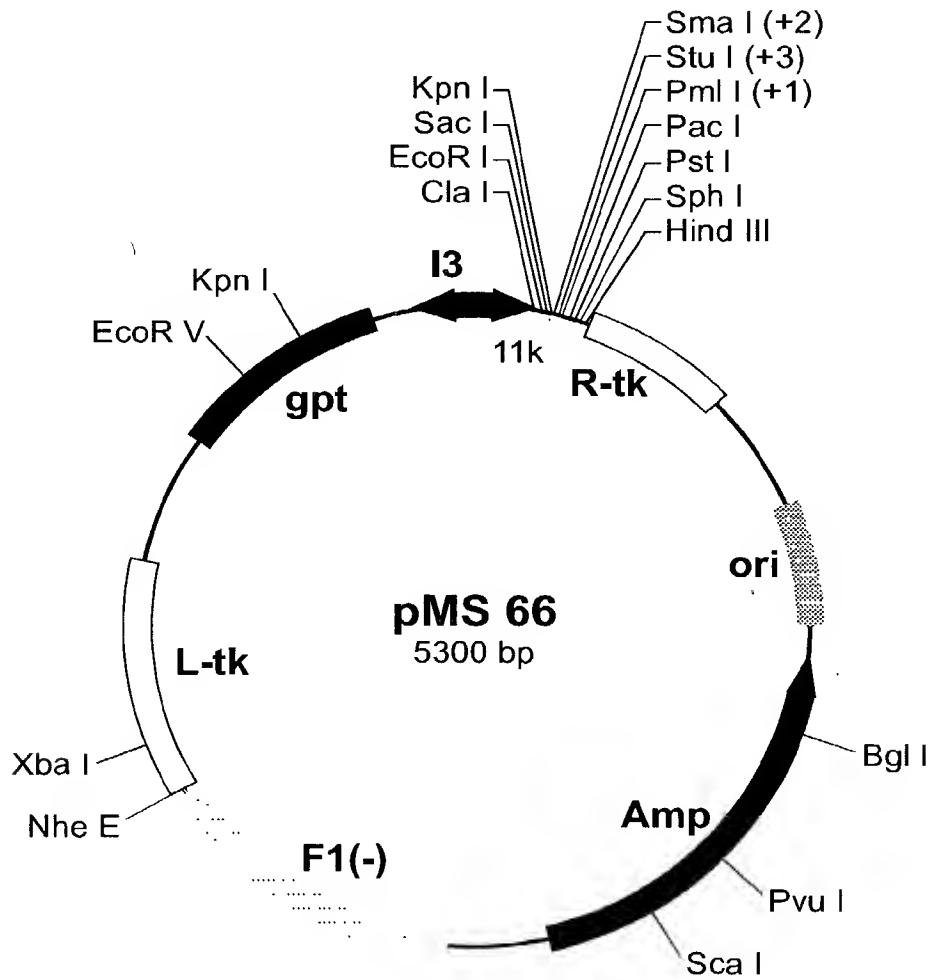


Figure 3

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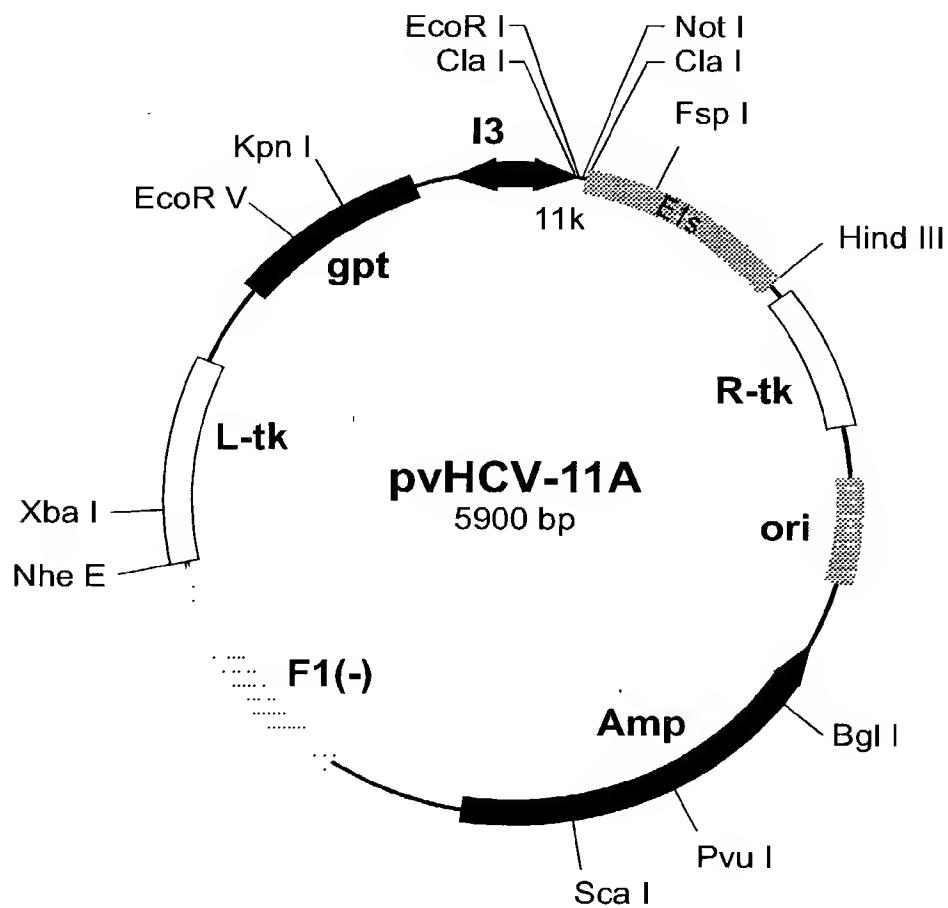


Figure 4

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Anti-E1 levels in NON-responders to IFN treatment

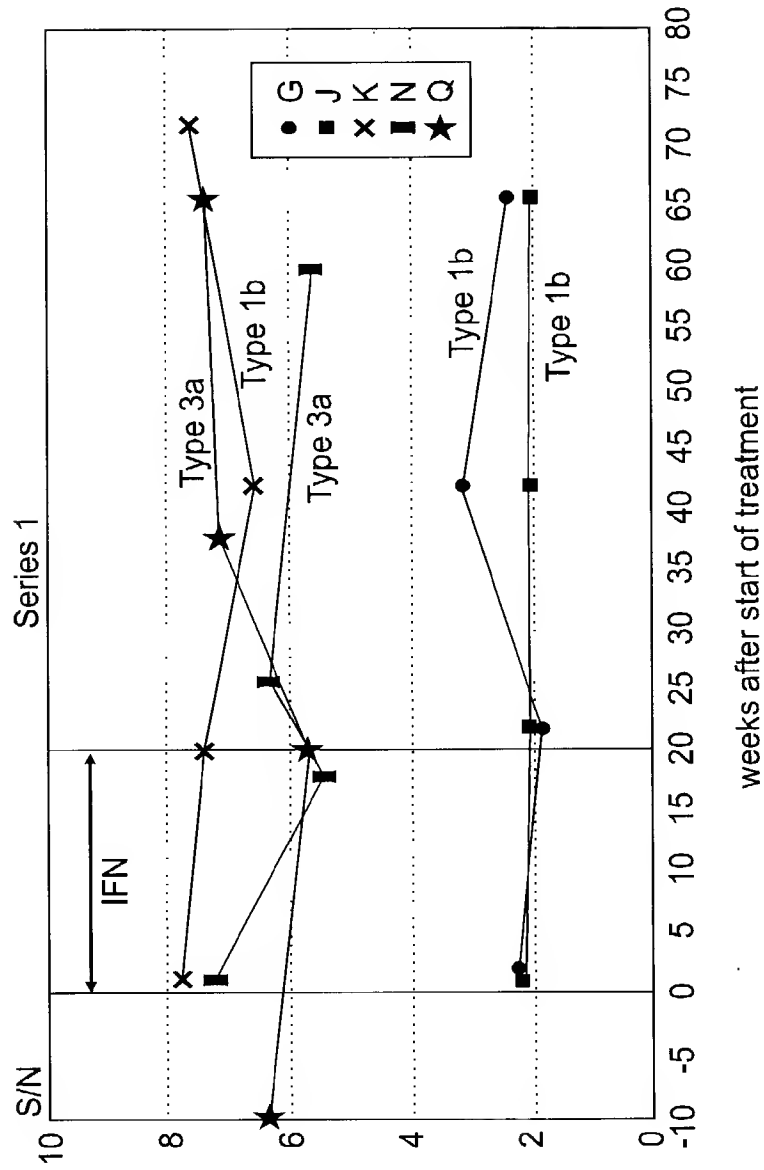


Figure 5



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Anti-E1 levels in RESPONDERS to IFN treatment

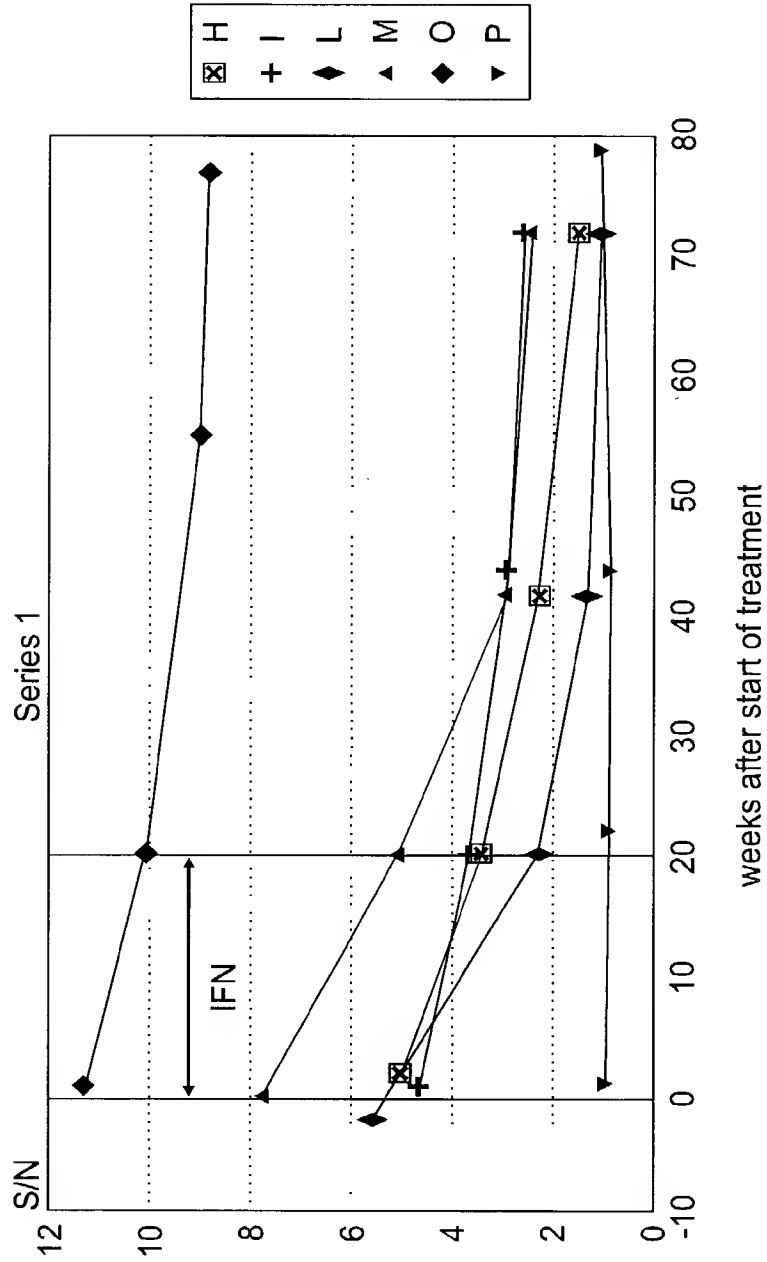


Figure 6

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Anti-E1 levels in patients with COMPLETE response to IFN

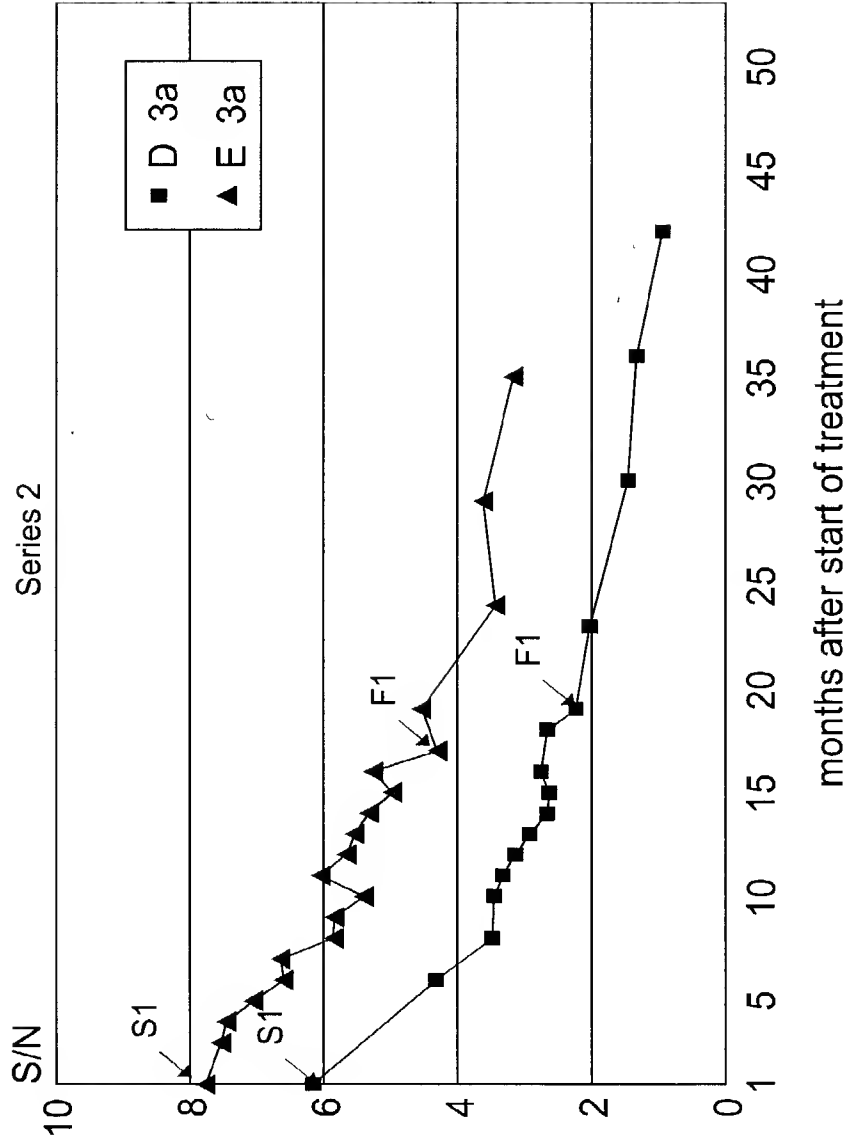


Figure 7



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Anti-E1 levels in INCOMPLETE responders to IFN treatment

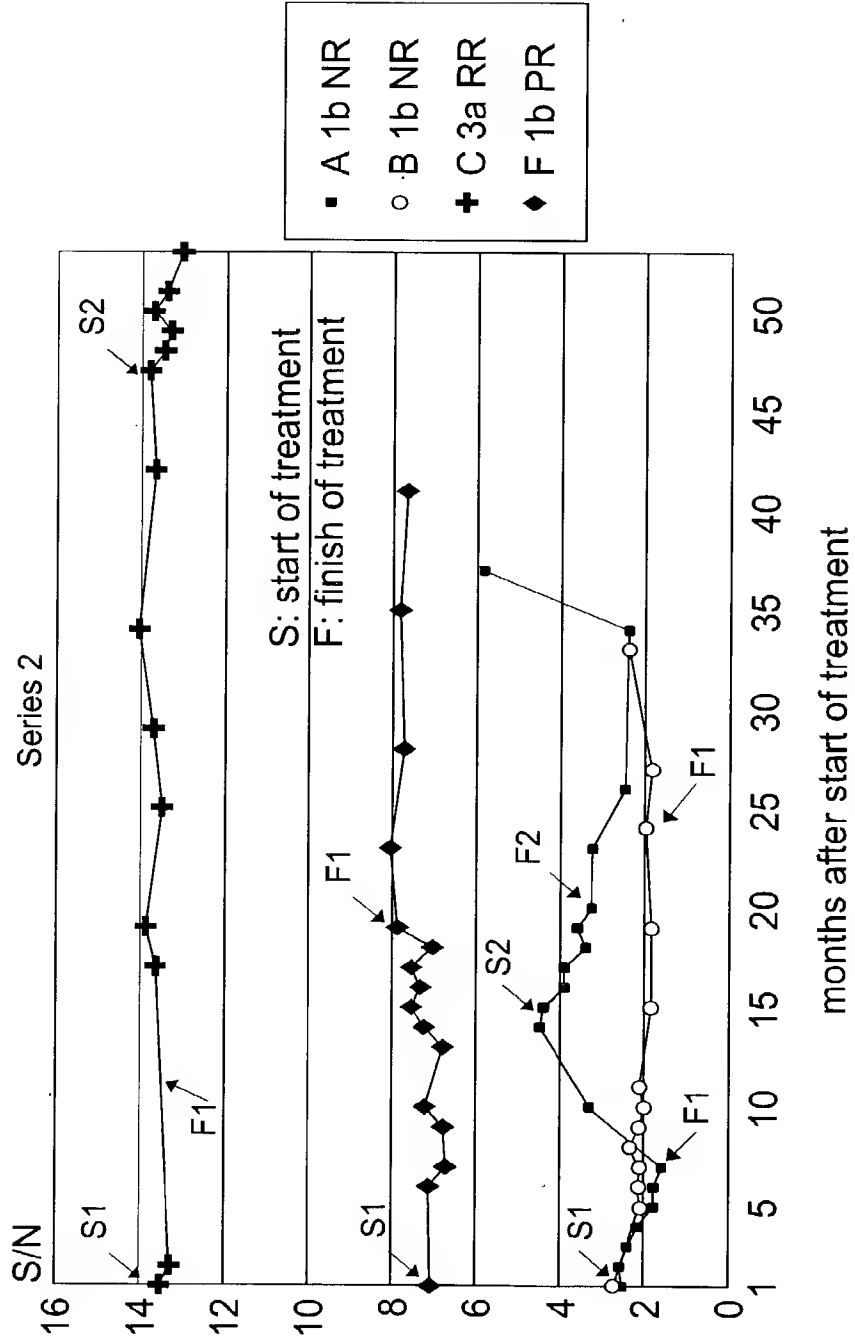


Figure 8

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Anti-E2 levels in RESPONDERS to IFN treatment

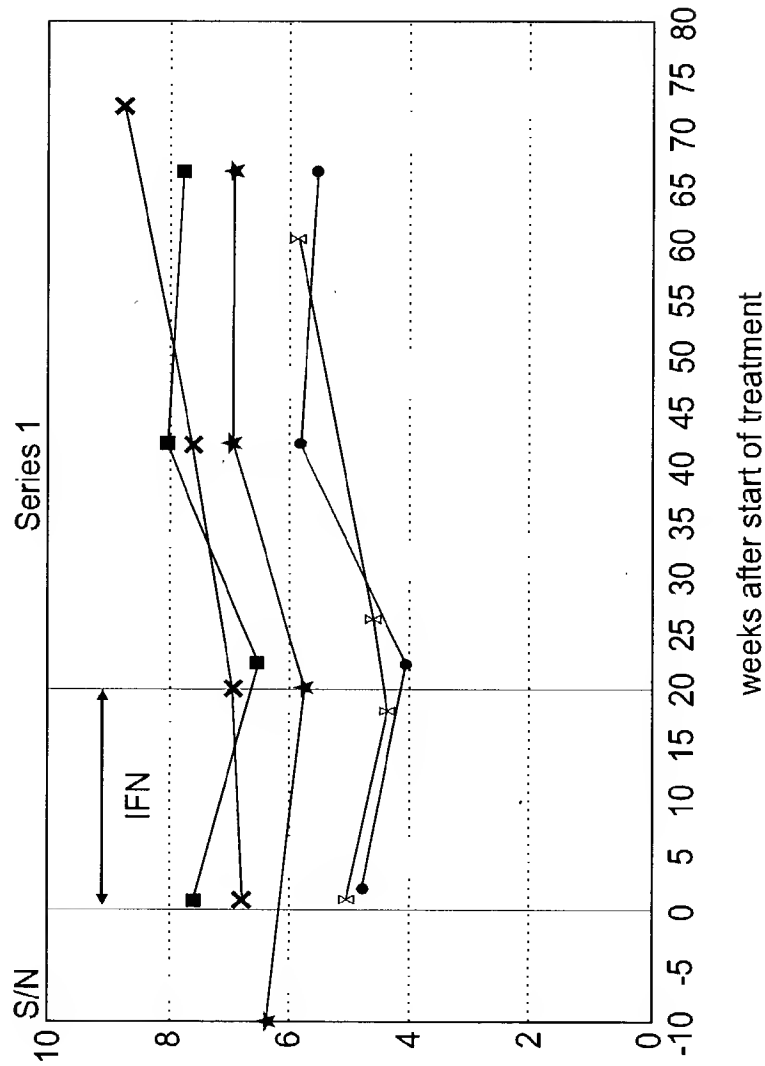


Figure 9



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Anti-E2 levels in RESPONDERS to IFN treatment

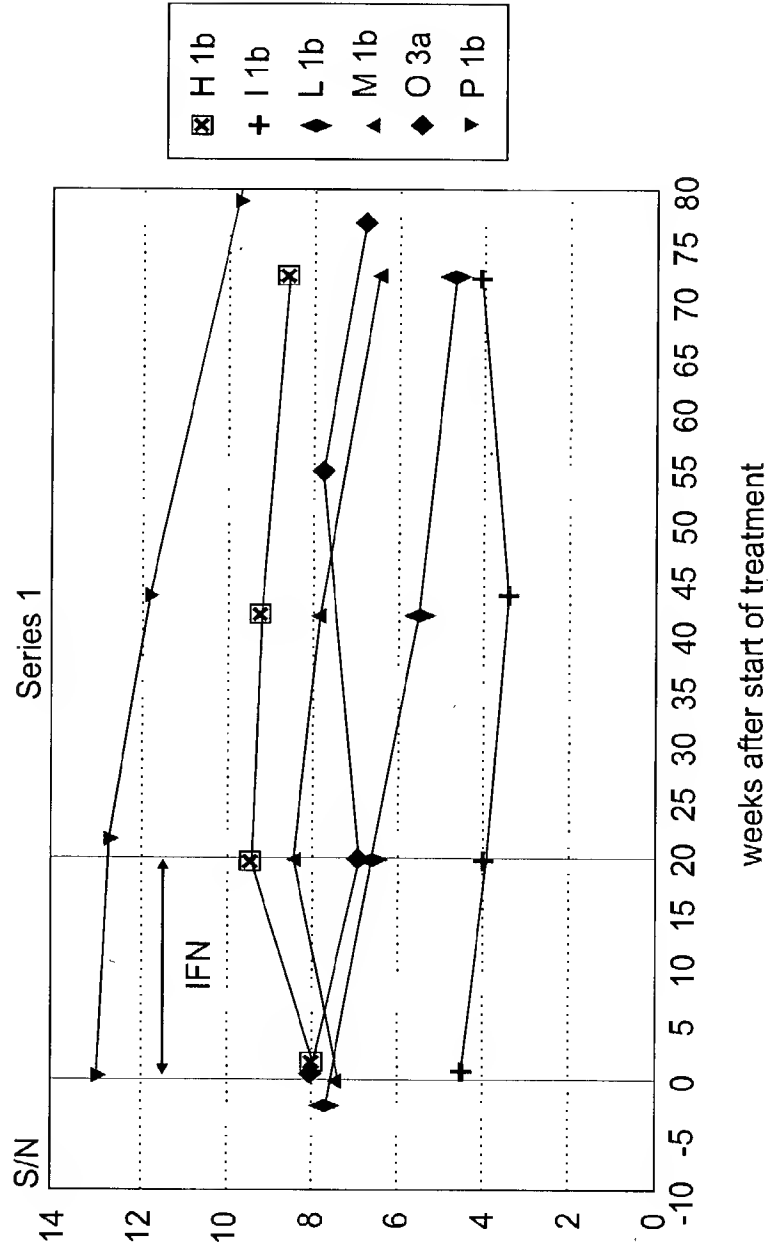


Figure 10



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Anti-E2 levels in INCOMPLETE responders to IFN treatment

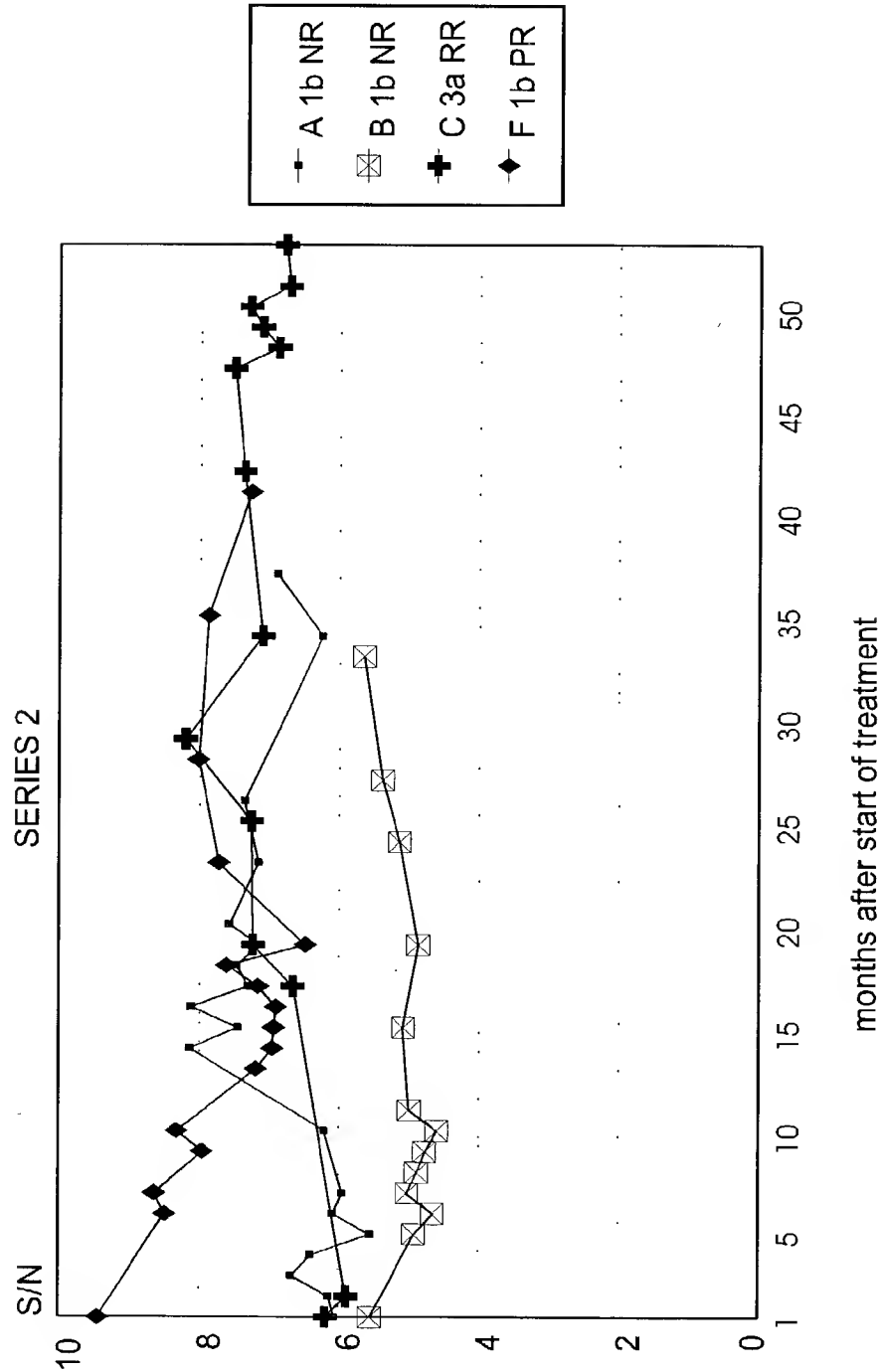


Figure 11



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Anti-E2 levels in COMPLETE responders to IFN treatment

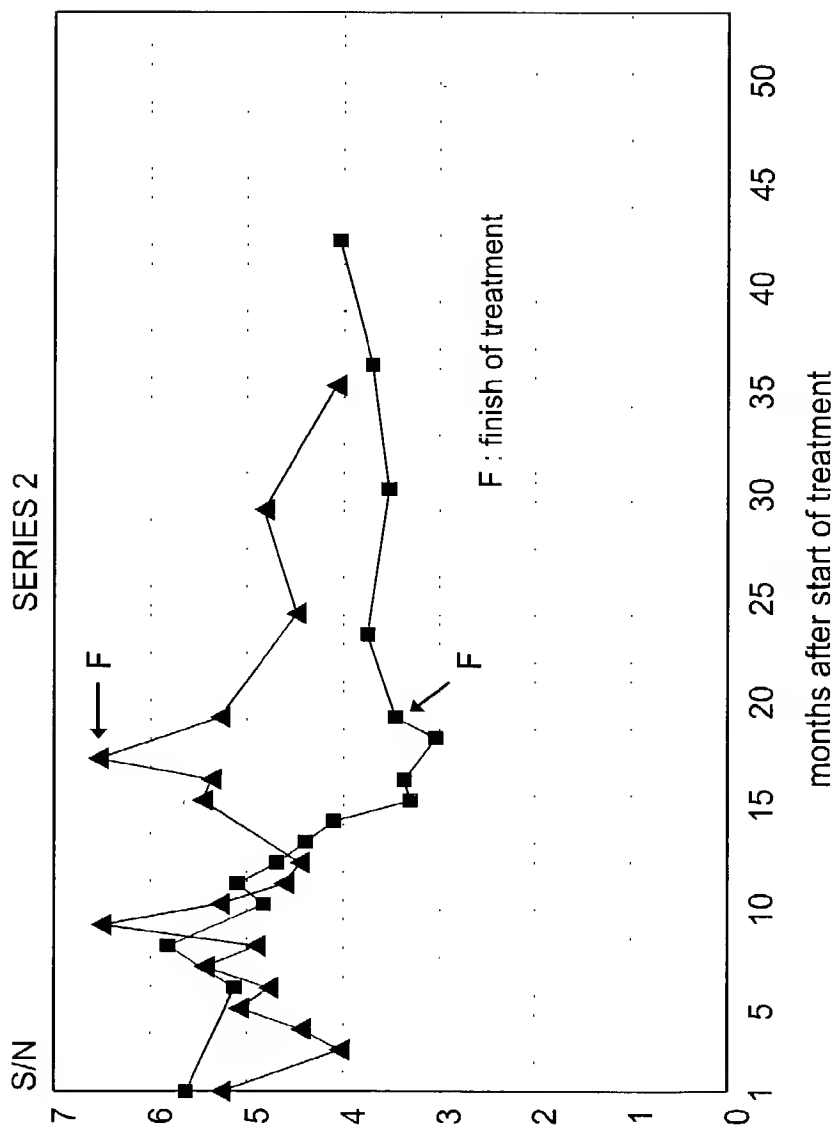


Figure 12

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Human anti-E1 reactivity competed with peptides

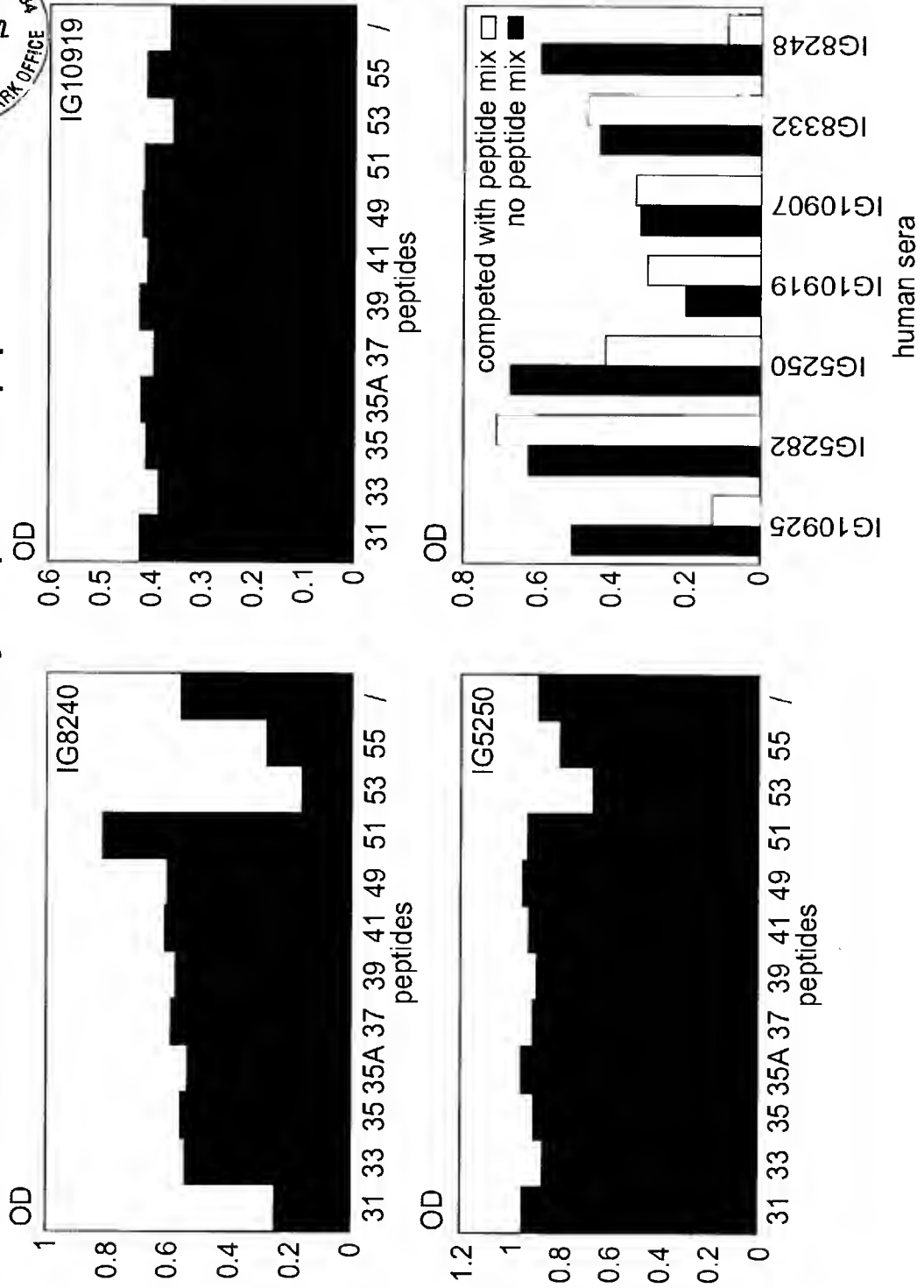


Figure 13



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Competition of reactivity of anti-E1 Mabs with peptides

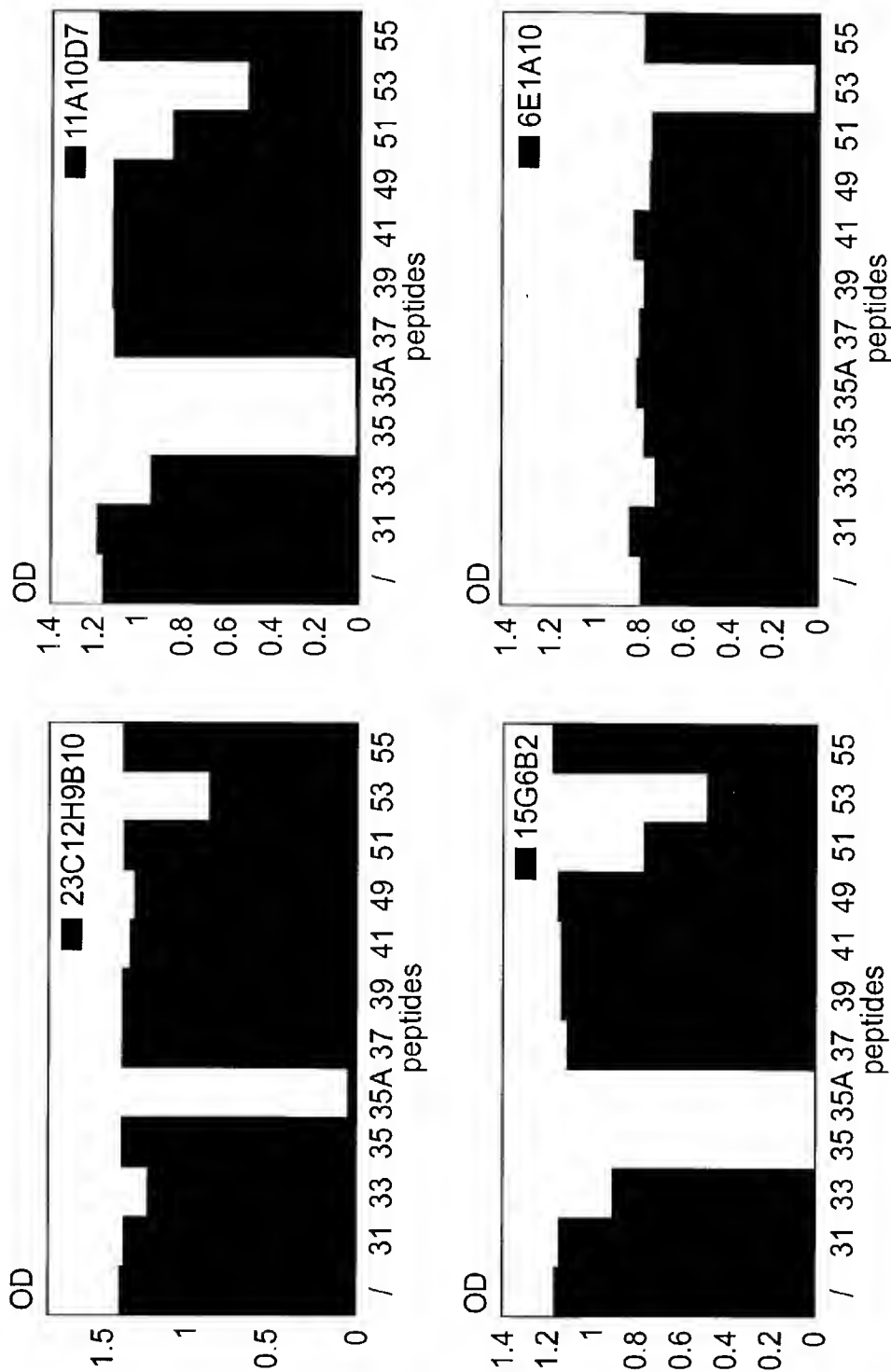


Figure 14



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Anti-E1 (epitope 1) levels in NON-RESPONDERS to IFN treatment

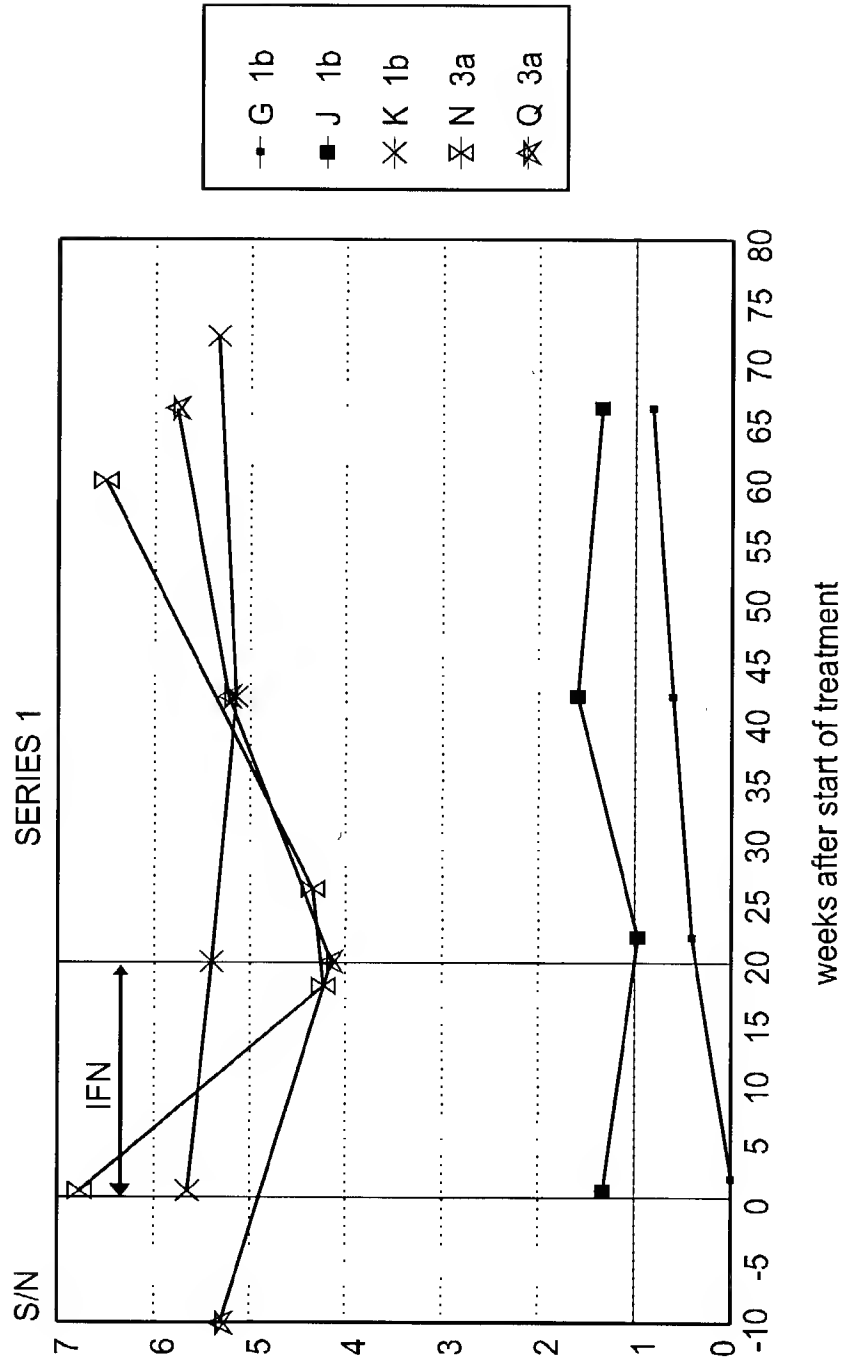


Figure 15



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Anti-E1 (epitope 1) levels in RESPONDERS to IFN treatment

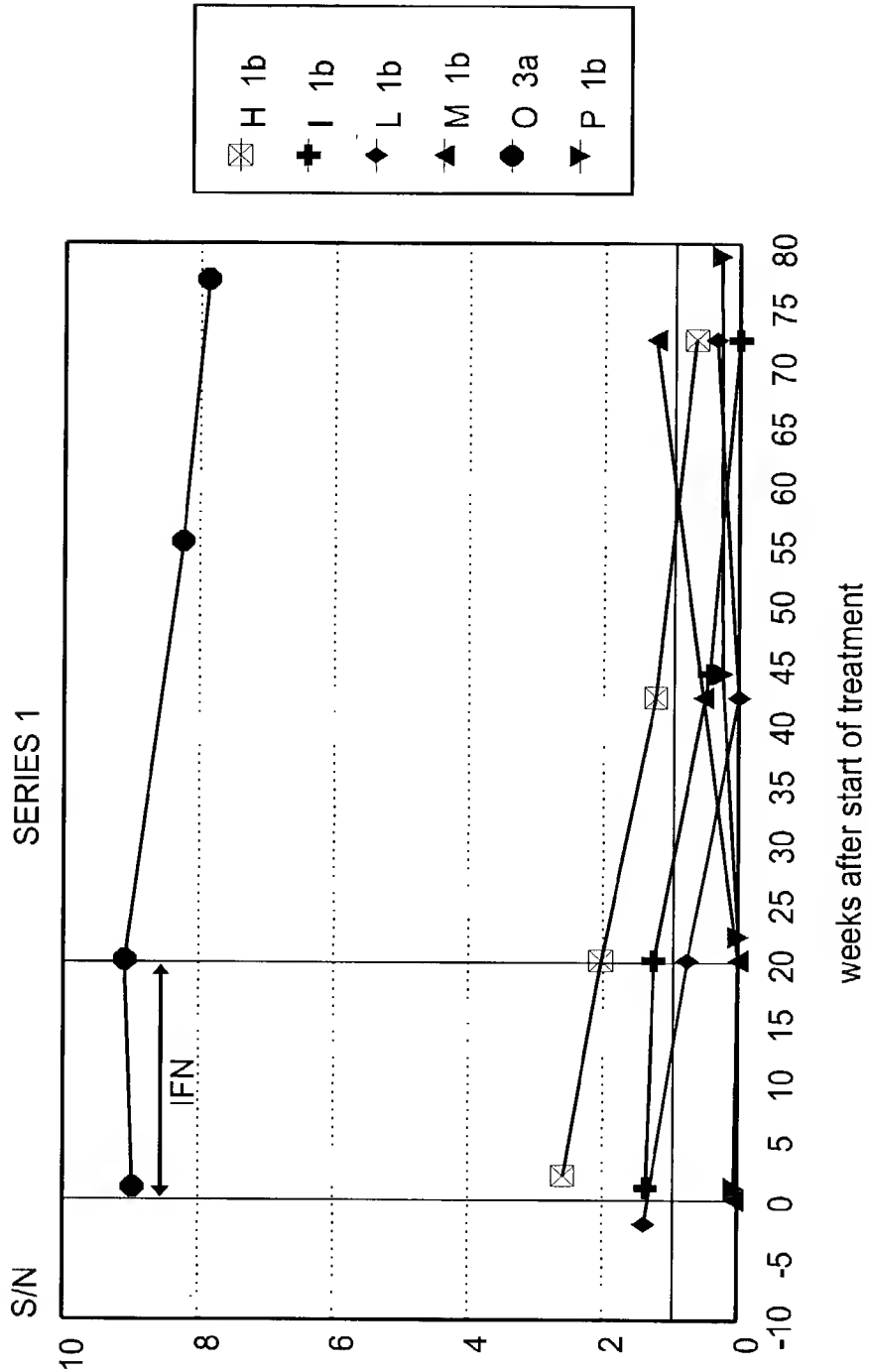


Figure 16



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Anti-E1 (epitope 2) levels in NON-RESPONDERS to IFN treatment

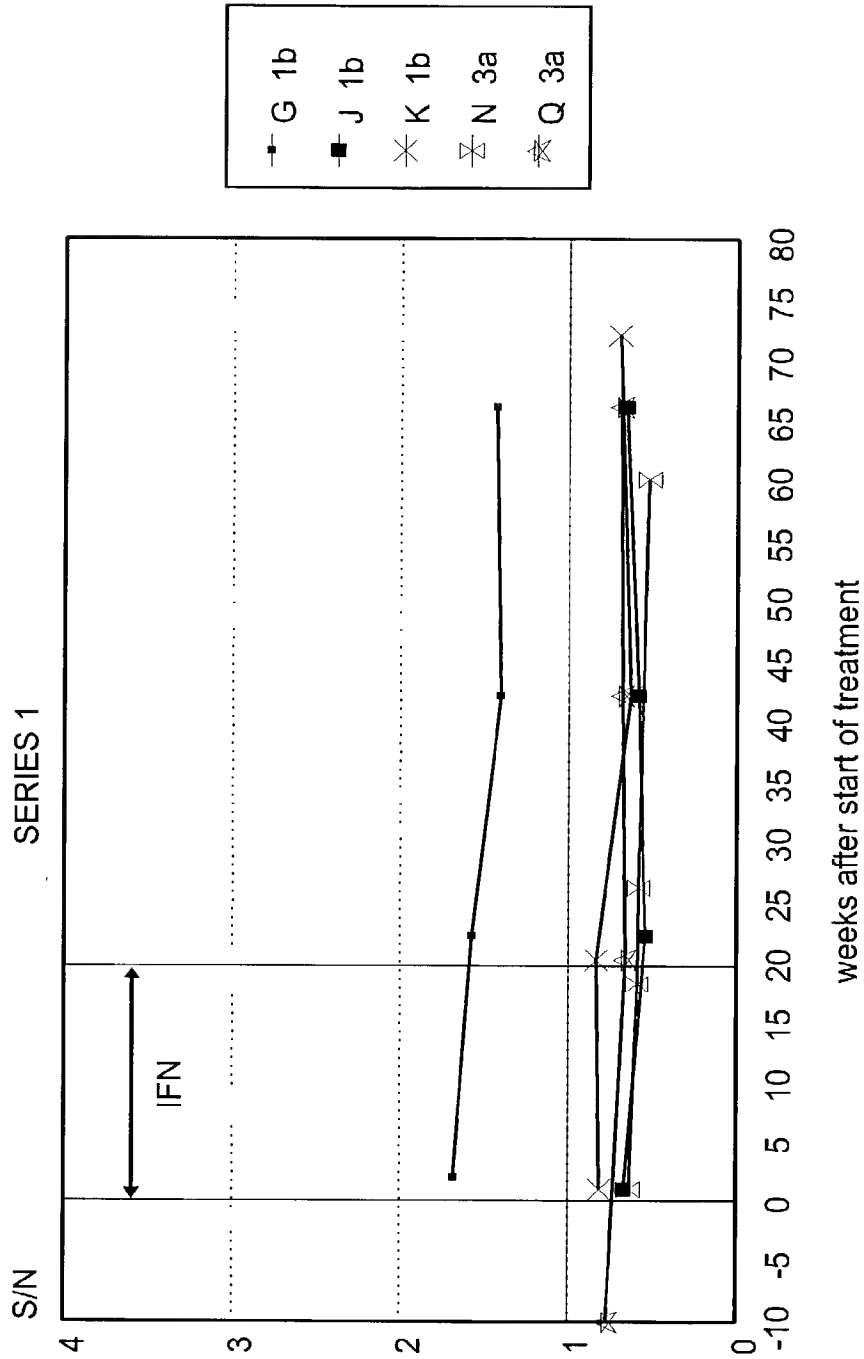


Figure 17

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Anti-E1 (epitope 2) levels in RESPONDERS to IFN treatment

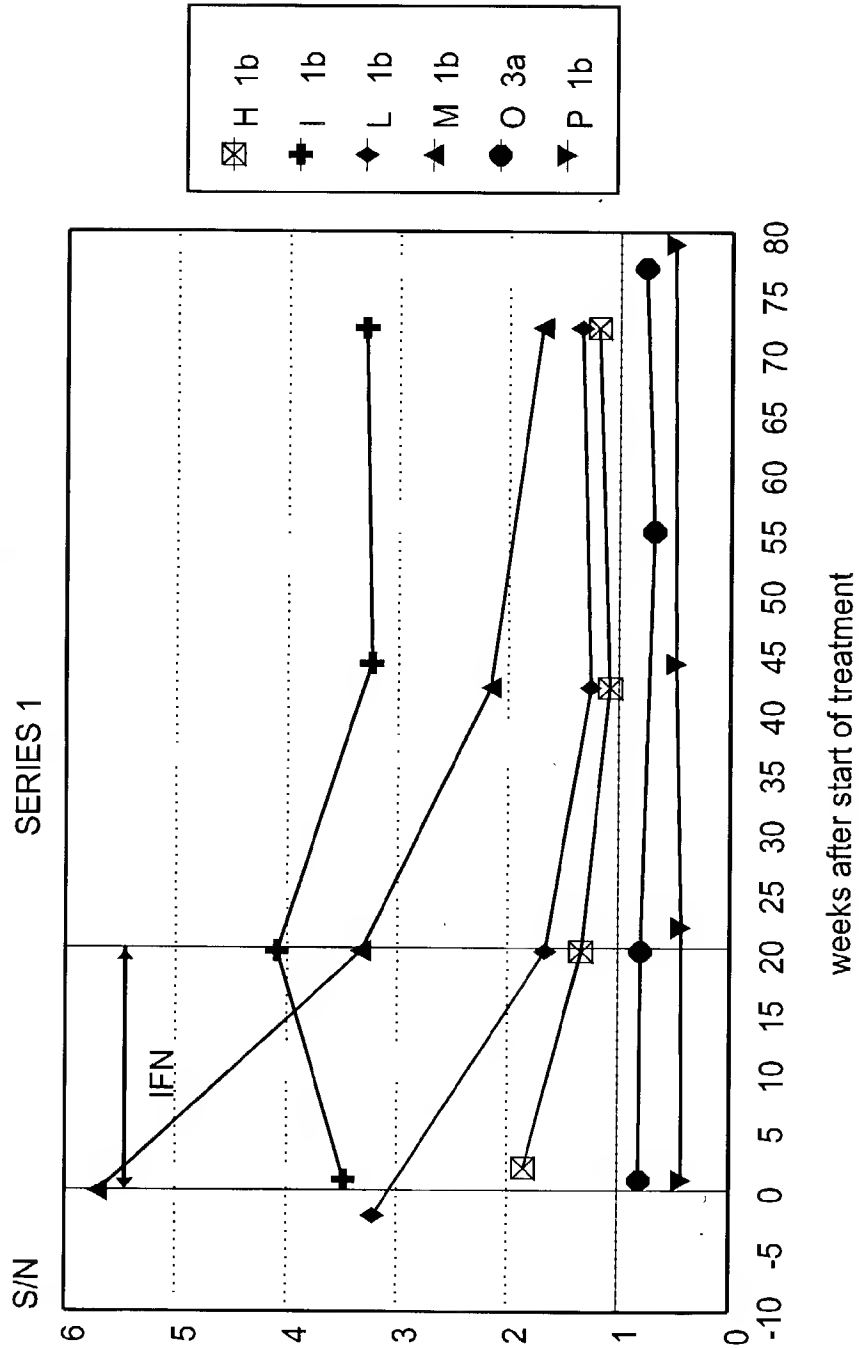


Figure 18

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Competition of reactivity of anti-E2 Mabs with peptides

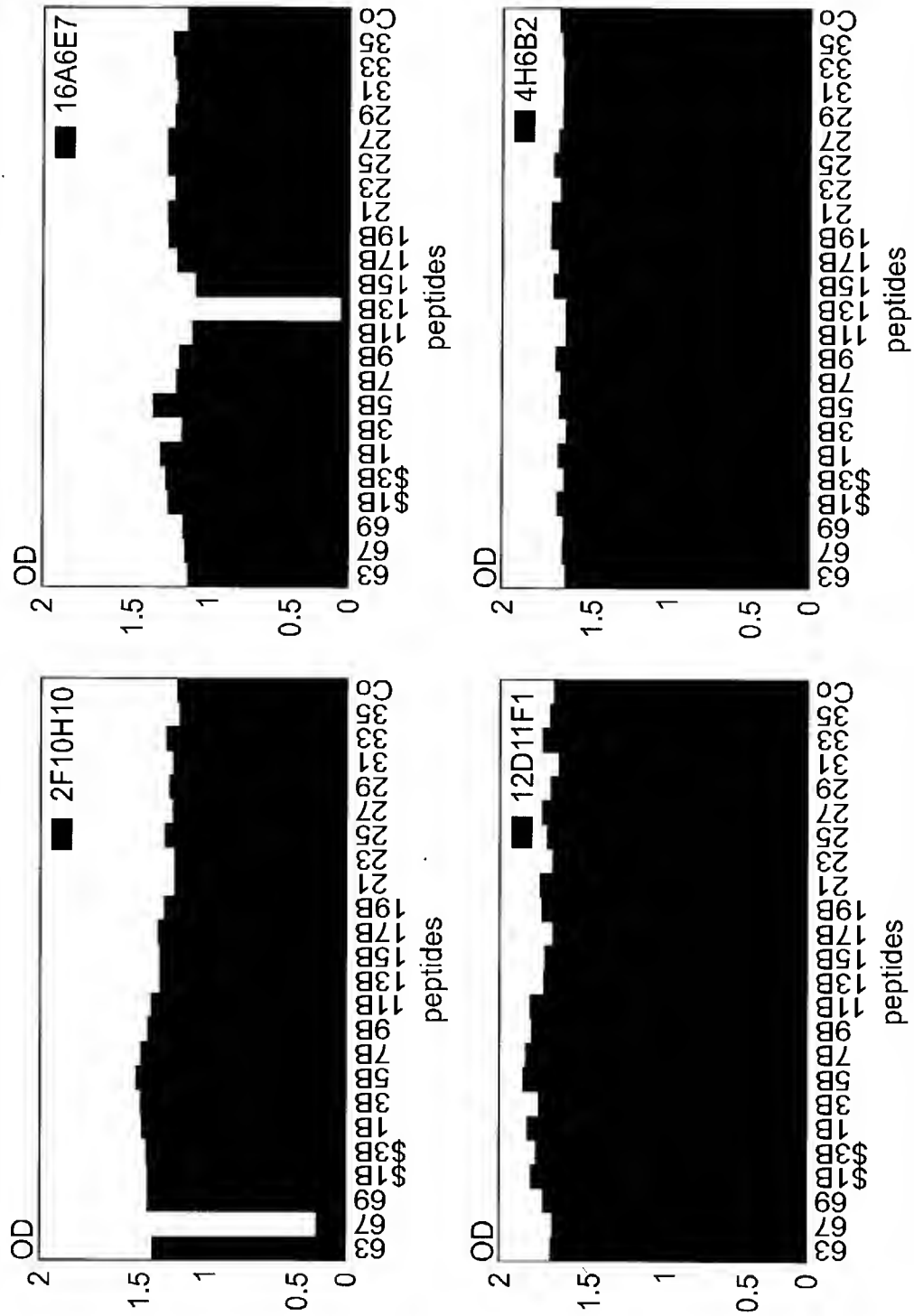


Figure 19

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Human anti-E2 reactivity competed with peptides

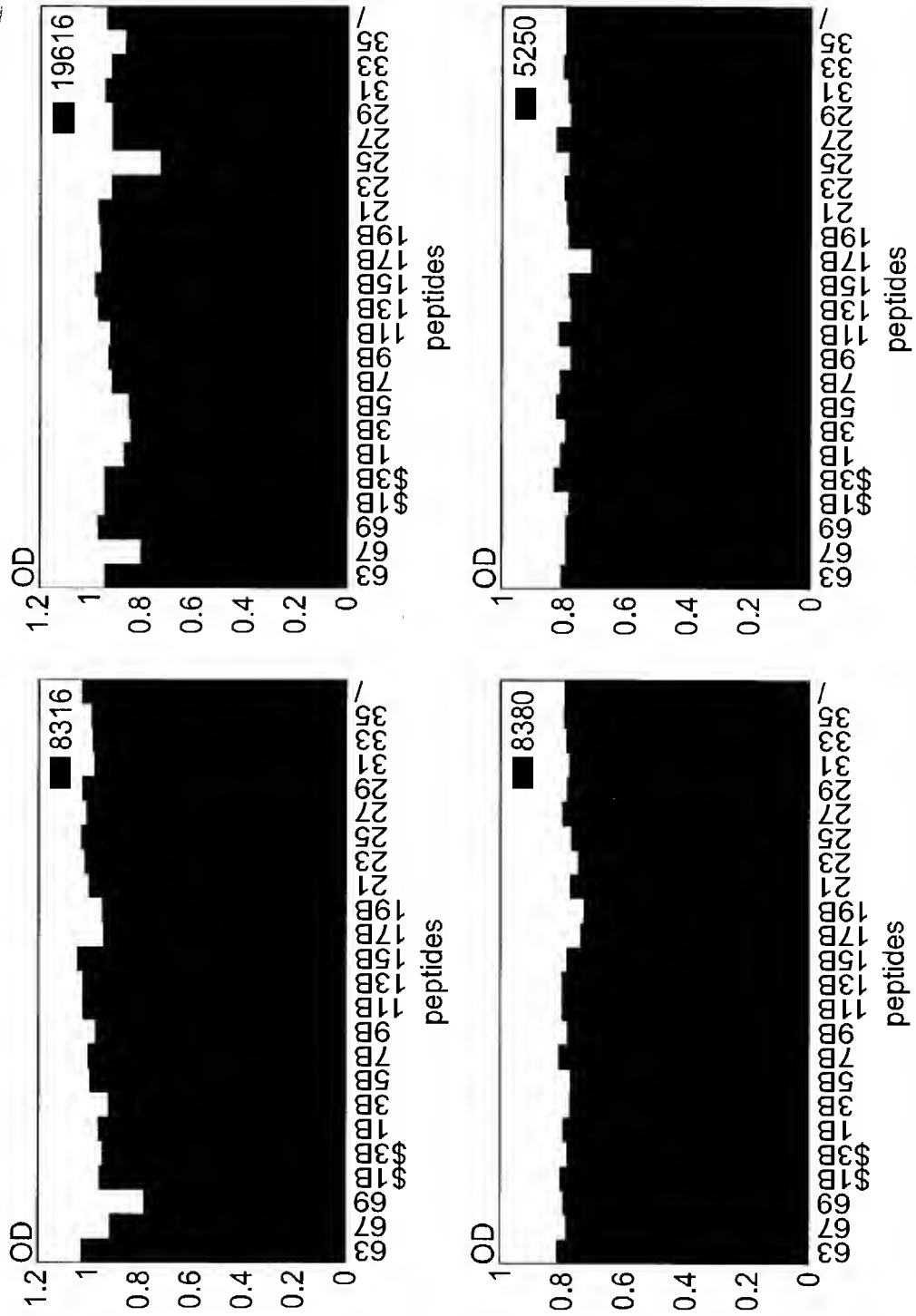


Figure 20



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GGCATGCAAGCTTAATTAATT 3' (SEQ ID NO 1)
3'ACGTCCGTACGTTTCAATTAATTAATCGA 5' (SEQ ID NO 94)

5'CCGGGGAGGCCTGCACGTGATCGAGGGCAGACACCATCACCACCATCACTAATAGTTA
ATTAAGTCA 3' (SEQ ID NO 2)
3'CCTCCGGACGTGCACTAGCTCCCGTCTGTGGTAGTGGTGGTAGTGATTATCAATTAAT
TG 5' (SEQ ID NO 95)

SEQ ID NO 3 (HCC19A)
ATGCCCCGGTTGCTCTTTCTCTATCTTCTCTTGGCTTTACTGTCTGTCTGACCATTCCA
GCTTCCGCTTATGAGGTGCGCAACGTGTCCGGGATGTACCATGTCACGAACGACTGCTCC
AACTCAAGCATTGTGTATGAGGCAGCGGACATGATCATGCACACCCCCGGGTGCGTGCCC
TGCGTTCCGGGAGAACAACCTTTCCCGCTGCTGGGTAGCGCTCACCCCCACGCTCGCAGCT
AGGAACGCCAGCGTCCCCACCACGACAATACGACGCCACGTCGATTTGCTCGTTGGGGCG
GCTGCTCTCTGTTCCGCTATGTACGTGGGGGATCTCTGCGGATCTGTCTTCTCTGCTCTCC
CAGCTGTTCAACCATCTCGCCTCGCCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATC
TATCCCGGCCACATAACAGGTCAACGTATGGCTTGGGATATGATGATGAAGTGGTGCCT
ACAACGGCCCTGGTGGTATCGCAGCTGCTCCGGATCCCAAGCTGTCGTGGACATGGTG
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SEQ ID NO 5 (HCC110A)
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TCCGGGATGTACCATGTCACGAACGACTGCTCCAACCTCAAGCATTGTGTATGAGGCAGCG
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TGCTGGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCGTCCCCACCACGACA
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GGGGACCTCTGCGGATCTGTCTTCTCGTCTCCAGCTGTTCAACCATCTCGCCTCGCCGG
CATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCCGGCCACATAACGGGTCAACGT
ATGGCTTGGGATATGATGATGAAGTGGTGCCTACAACGGCCCTGGTGGTATCGCAGCTG
CTCCGGATCCCAAGCTGTGCTGGACATGGTGGCGGGGGCCCATTTGGGGAGTCTTGGCG
GGTCTCGCCTACTATTCCATGGTGGGGAAGTGGGCTAAGGTTTTGATTGTGATGCTACTC
TTTGCTCCCTAATAG

SEQ ID NO 7 (HCC111A)

Figure 21A



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ATGTTGGGTAAGGTCATCGATACCCTTACGTGCGGCTTCGCCGACCTCATGGGGTACATT
 CCGCTCGTCGGCGCCCCCTAGGGGGTGCTGCCAGAGCCCTGGCGCATGGCGTCCGGGTT
 CTGGAAGACGGCGTGAACATATGCAACAGGGAATTTGCCTGGTTGCTCTTTCTCTATCTTC
 CTCTTGGCTTTACTGTCTGTCTGACCATTCCAGCTTCCGCTTATGAGGTGCGCAACGTG
 TCCGGGATGTACCATGTACGAACGACTGCTCCAACCTCAAGCATTGTGTATGAGGCAGCG
 GACATGATCATGCACACCCCCGGGTGCGTGCCCTGCGTTCGGGAGAACAACCTTTCCCGC
 TGCTGGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCGTCCCCACTACGACA
 ATACGACGCCACGTGCGATTTGCTCGTTGGGGCGGCTGCTTTCTGTTCCGCTATGTACGTG
 GGGGATCTCTGCGGATCTGTCTTCTCGTCTCCAGCTGTTACCATCTCGCTCGCCGG
 CATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCCGGCCACATAACAGGTCACCGT
 ATGGCTTGGGATATGATGATGAACTGGTAATAG

SEQ ID NO 9 (HCC112A)

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 GCTTCCGCTTATGAAGTGCGCAACGTGTCCGGGGTGTAACATGTCACGAACGACTGCTCC
 AACTCAAGCATAGTGTATGAGGCAGCGGACATGATCATGCACACCCCCGGGTGCGTGCCC
 TGCGTTCCGGAGGGCAACTCCTCCCGTTGCTGGGTGGCGCTCACTCCCACGCTCGCGGCC
 AGGAACGCCAGCGTCCCCACAACGACAATACGACGCCACGTGCGATTTGCTCGTTGGGGCT
 GCTGCTTTCTGTTCCGCTATGTACGTGGGGGATCTCTGCGGATCTGTTTTCTTGTTC
 CAGCTGTTACCTTCTCACCTCGCCGGCATCAAACAGTACAGGACTGCAACTGCTCAATC
 TATCCCGGCCATGTATCAGGTCACCGCATGGCTTGGGATATGATGATGAACTGGTCCTAA
 TAG

SEQ ID NO 11 (HCC113A)

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 TGCGTTCCGGAGGGCAACTCCTCCCGTTGCTGGGTGGCGCTCACTCCCACGCTCGCGGCC
 AGGAACGCCAGCGTCCCCACAACGACAATACGACGCCACGTGCGATTTGCTCGTTGGGGCT
 GCTGCTTTCTGTTCCGCTATGTACGTGGGGGATCTCTGCGGATCTGTTTTCTTGTTC
 CAGCTGTTACCTTCTCACCTCGCCGGCATCAAACAGTACAGGACTGCAACTGCTCAATC
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SEQ ID NO 13 (HCC117A)

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 CCGCTCGTCGGCGCCCCCTAGGGGGCGTGCCAGGGCCCTGGCGCATGGCGTCCGGGTT
 CTGGAAGACGGCGTGAACATATGCAACAGGGAATTTGCCTGGTTGCTCTTTCTCTATCTTC
 CTCTTGGCTTTACTGTCTGTCTAACCATTCCAGCTTCCGCTTACGAGGTGCGCAACGTG
 TCCGGGATGTACCATGTACGAACGACTGCTCCAACCTCAAGCATTGTGTATGAGGCAGCG
 GACATGATCATGCACACCCCCGGGTGCGTGCCCTGCGTTCGGGAGAACAACCTTTCCCGC
 TGCTGGGTAGCGCTCACCCCCACGCTCGCGGCTAGGAACGCCAGCATCCCCACTACAACA

Figure 21B



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ATACGACGCCACGTCGATTTGCTCGTTGGGGCGGCTGCTTTCTGTTCCGCTATGTACGTG
GGGGATCTCTGCGGATCTGTCTTCCTCGTCTCCCAGCTGTTACCATCTCGCCTCGCCGG
CATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCCGGCCACATAACGGGTCACCGT
ATGGCTTGGGATATGATGATGAACTGGTACTAATAG

SEQ ID NO 15 (HCP51)

ATGCCCCGTTGCTCTTTCTCTATCTT

SEQ ID NO 16 (HCP52)

ATGTTGGGTAAGGTCATCGATACCCCT

SEQ ID NO 17 (HCP53)

CTATTAGGACCAGTTCATCATCATATCCCA

SEQ ID NO 18 (HCP54)

CTATTACCAGTTCATCATCATATCCCA

SEQ ID NO 19 (HCP107)

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SEQ ID NO 20 (HCP108)

GATGGTGAACAGCTGGGAATCGACGTGGCGTCGTAT

SEQ ID NO 21 (HCC137)

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CTCTTGGCTTTGCTGTCTGTCTGACCGTTCCAGCTTCCGCTTATGAAGTGCAGCAACGTG
TCCGGGATGTACCATGTACGAACGACTGCTCCAAGTCAAGCATTGTGTATGAGGCAGCG
GACATGATCATGCACACCCCCGGGTGCGTGCCCTGCGTTCCGGGAGAACAACTCTTCCCGC
TGCTGGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCGTCCCCACCACGACA
ATACGACGCCACGTCGATTCAGCTGTTACCATCTCGCCTCGCCGGCATGAGACGGTG
CAGGACTGCAATTGCTCAATCTATCCCGGCCACATAACGGGTCACCGTATGGCTTGGGAT
ATGATGATGAACTGGTCGCCTACAACGGGCCCTGGTGGTATCGCAGCTGCTCCGGATCCCA
CAAGCTGTGCTGGACATGGTGGCGGGGGGCCATTGGGGAGTCTGGCGGGTCTCGCCTAC
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TAG

SEQ ID NO 23 (HCC138)

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CTGGAGGACGGCGTGAAGTATGCAACAGGGAATTTGCCCGGTTGCTCTTTCTCTATCTTC
CTCTTGGCTTTGCTGTCTGTCTGACCGTTCCAGCTTCCGCTTATGAAGTGCAGCAACGTG
TCCGGGATGTACCATGTACGAACGACTGCTCCAAGTCAAGCATTGTGTATGAGGCAGCG

Figure 21C



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GACATGATCATGCACACCCCCGGGTGCGTGCCCTGCGTTCGGGAGAACAACCTCTTCCCGC
TGCTGGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCGTCCCCACCACGACA
ATACGACGCCACGTCGATTCCCAGCTGTTACCATCTCGCCTCGCCGGCATGAGACGGTG
CAGGACTGCAATTGCTCAATCTATCCCGGCCACATAACGGGTACCGTATGGCTTGGGAT
ATGATGATGAACTGGTAATAG

SEQ ID NO 25 (HCC139)

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CTGGAGGACGGCGTGAACATGCAACAGGGAATTTGCCCGGTTGCTCTTTCTCTATCTTC
CTCTTGGCTTTGCTGTCTGTCTGACCGTTCCAGCTTCCGCTTATGAAGTGCGCAACGTG
TCCGGGATGTACCATGTACGAACGACTGCTCCAACCTCAAGCATTGTGTATGAGGCAGCG
GACATGATCATGCACACCCCCGGGTGCGTGCCCTGCGTTCGGGAGAACAACCTCTTCCCGC
TGCTGGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCGTCCCCACCACGACA
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CAGGACTGCAATTGCTCAATCTATCCCGGCCACATAACGGGTACCGTATGGCTTGGGAT
ATGATGATGAACTGGTCGCCTACAACGGCCCTGGTGGTATCGCAGCTGCTCCGGATCCTC
TAATAG

SEQ ID NO 27 (HCC140)

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CTCTTGGCTTTGCTGTCTGTCTGACCGTTCCAGCTTCCGCTTATGAAGTGCGCAACGTG
TCCGGGATGTACCATGTACGAACGACTGCTCCAACCTCAAGCATTGTGTATGAGGCAGCG
GACATGATCATGCACACCCCCGGGTGCGTGCCCTGCGTTCGGGAGAACAACCTCTTCCCGC
TGCTGGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCGTCCCCACCACGACA
ATACGACGCCACGTCGATTCCCAGCTGTTACCATCTCGCCTCGCCGGCATGAGACGGTG
CAGGACTGCAATTGCTCAATCTATCCCGGCCACATAACGGGTACCGTATGGCTTGGGAT
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ATCGAGGGCAGACACCATCACCACCATCACTAATAG

SEQ ID NO 29 (HCC162)

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CTCGTCGGCGCTCCCGTAGGAGGCGTCGCAAGAGCCCTTGCGCATGGCGTGAGGGCCCTT
GAAGACGGGATAAATTTGCAACAGGGAATTTGCCCGGTTGCTCCTTTTCTATTTTCTT
CTCGCTCTGTTCTTGTCTAATTCATCCAGCAGCTAGTCTAGAGTGGCGGAATACGTCT
GGCCTCTATGTCCTTACCAACGACTGTTCCAATAGCAGTATTGTGTACGAGGCCGATGAC
GTTATTCTGCACACACCCGGCTGCATACCTTGTGTCCAGGACGGCAATACATCCACGTGC
TGGACCCAGTGACACCTACAGTGGCAGTCAAGTACGTGCGAGCAACCACCGCTTCGATA
CGCAGTCATGTGGACCTATTAGTGGGCGCGGCCACGATGTGCTCTGCGCTCTACGTGGGT
GACATGTGTGGGGCTGTCTTCTCGTGGGACAAGCCTTCACGTTACAGACCTCGTCGCCAT

Figure 21D



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CAAACGGTCCAGACCTGTAAGTCTGCTCGCTGTACCCAGGCCATCTTTCAGGACATCGAATG
GCTTGGGATATGATGATGAACTGGTAATAG

SEQ ID NO 31 (HCC163)

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CTCGTAGGCGGGCCCATTTGGGGGCGTCGCAAGGGCTCTCGCACACGGTGTGAGGGTCCTT
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CTTGCTCTTCTCTCGTGTCTGACCGTTTCGGCCTCTGCAGTTCCTACCGAAATGCCTCT
GGGATTTATCATGTTACCAATGATTGCCCAAACCTTTCCATAGTCTATGAGGCAGATAAC
CTGATCCTACACGCACCTGGTTGCGTGCCTTGTGTCTATGACAGGTAATGTGAGTAGATGC
TGGGTCCAAATTACCCCTACACTGTCAGCCCCGAGCCTCGGAGCAGTCACGGCTCCTCTT
CGGAGAGCCGTTGACTACCTAGCGGGAGGGGCTGCCCTCTGCTCCGCGTTATACGTAGGA
GACGCGTGTGGGGCACTATTCTTGGTAGGCCAAATGTTACCTATAGGCCTCGCCAGCAC
GCTACGGTGCAGAACTGCAACTGTTCCATTTACAGTGGCCATGTTACCGGCCACCGGATG
GCATGGGATATGATGATGAACTGGTAATAG

SEQ ID NO 33 (HCP109)

TGGGATATGATGATGAACTGGTC

SEQ ID NO 34 (HCP172)

CTATTATGGTGGTAAKGCCARCARGAGCAGGAG

SEQ ID NO 35 (HCCL22A)

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GCCTACTATTCCATGGTGGGGAACCTGGGCTAAGGTTTTGGTTGTGATGCTACTCTTTGCC
GGCGTCGACGGGCATACCCGCGTGTGAGGAGGGGAGCAGCCTCCGATACCAGGGGCCTT
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TCTCAGGTGTGCGGTCCAGTGTATTGCTTACCCCGAGCCCTGTTGTGGTGGGGACGACC
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ACCTGCCCCACTGACTGTTTTCGGAAGCACCCCGAGGCCACCTACGCCAGATGCGGTTCT
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TGCCTGTCAACTTCACCATCTTCAAGGTTAGGATGTACGTGGGGGGCGTGGAGCACAGG
TTCGAAGCCGCATGCAATTGGACTCGAGGAGAGCGTTGTGACTTGGAGGACAGGGATAGA
TCAGAGCTTAGCCCGCTGCTGCTGTCTACAACAGAGTGGCAGATACTGCCCTGTTCTTC

Figure 21E

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ACCACCCTGCCGGCCCTATCCACCGGCCTGATCCACCTCCATCAGAACATCGTGGACGTG
 CAATACCTGTACGGTGTAGGGTCGGCGGTTGTCTCCCTTGTATCAAATGGGAGTATGTC
 CTGTTGCTCTTCCTTCTCCTGGCAGACGCGCGCATCTGCGCCTGCTTATGGATGATGCTG
 CTGATAGCTCAAGCTGAGGCCGCCCTTAGAGAACCTGGTGGTCTCAATGCGGCGGCCGTG
 GCCGGGGCGCATGGCACTCTTTCCTTCTTGTGTTCTTCTGTGCTGCCTGGTACATCAAG
 GGCAGGCTGGTCCCTGGTGGGCATACGCCCTTCTATGGCGTGTGGCCGCTGCTCCTGCTT
 CTGCTGGCCTTACCACCACGAGCTTATGCCTAGTAA

SEQ ID NO 37 (HCC141)

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 CGGCGTCGACGGGCATACCCGCGTGTGAGGAGGGGCAGCAGCCTCCGATACCAGGGGCCT
 TGTGTCCCTCTTTAGCCCCGGGTGGCTCAGAAAATCCAGCTCGTAAACACCAACGGCAG
 TTGGCACATCAACAGGACTGCCCTGAAGTGAACGACTCCCTCCAAACAGGGTTCTTTGC
 CGCACTATTCTACAAACACAAATTCAACTCGTCTGGATGCCAGAGCGCTTGGCCAGCTG
 TCGCTCCATCGACAAGTTCGCTCAGGGGTGGGGTCCCCTCACTTACACTGAGCCTAACAG
 CTCGGACCAGAGGGCCCTACTGCTGGCACTACGCGCCTCGACCGTGTGGTATTGTACCCGC
 GTCTCAGGTGTGCGGTCCAGTGTATTGCTTCACCCCGAGCCCTGTTGTGGTGGGGACGAC
 CGATCGGTTTGGTGTCCCCACGTATAACTGGGGGGCGAACGACTCGGATGTGCTGATTCT
 CAACAACACGCGGCCGCCGCGAGGCAACTGGTTCGGCTGTACATGGATGAATGGCACTGG
 GTTCACCAAGACGTGTGGGGGGCCCCCGTGCAACATCGGGGGGGCCGGCAACAACACCTT
 GACCTGCCCCACTGACTGTTTTCGGAAGCACCCCGAGGCCACCTACGCCAGATGCGGTTCT
 TGGGCCCTGGCTGACACCTAGGTGTATGGTTTATTACCCATATAGGCTCTGGCACTACCC
 CTGCACTGTCAACTTCACCATCTTCAAGTTAGGATGTACGTGGGGGGCGTGGAGCACAG
 GTTCGAAGCCGCATGCAATTGGACTCGAGGAGAGCGTTGTGACTTGGAGGACAGGGATAG
 ATCAGAGCTTAGCCCGCTGCTGCTGTCTACAACAGAGTGGCAGAGTGGCAGAGCTTAATT
 AATTAG

SEQ ID NO 39 (HCC142)

GATCCCAACAAGCTGTCGTGGACATGGTGGCGGGGGGCCATTGGGGAGTCCTGGCGGGCCT
 CGCCTACTATTCCATGGTGGGGAAGTGGGCTAAGGTTTTGGTTGTGATGCTACTCTTTGC
 CGGCGTCGACGGGCATACCCGCGTGTGAGGAGGGGCAGCAGCCTCCGATACCAGGGGCCT
 TGTGTCCCTCTTTAGCCCCGGGTGGCTCAGAAAATCCAGCTCGTAAACACCAACGGCAG
 TTGGCACATCAACAGGACTGCCCTGAAGTGAACGACTCCCTCCAAACAGGGTTCTTTGC
 CGCACTATTCTACAAACACAAATTCAACTCGTCTGGATGCCAGAGCGCTTGGCCAGCTG
 TCGCTCCATCGACAAGTTCGCTCAGGGGTGGGGTCCCCTCACTTACACTGAGCCTAACAG
 CTCGGACCAGAGGGCCCTACTGCTGGCACTACGCGCCTCGACCGTGTGGTATTGTACCCGC
 GTCTCAGGTGTGCGGTCCAGTGTATTGCTTCACCCCGAGCCCTGTTGTGGTGGGGACGAC
 CGATCGGTTTGGTGTCCCCACGTATAACTGGGGGGCGAACGACTCGGATGTGCTGATTCT
 CAACAACACGCGGCCGCCGCGAGGCAACTGGTTCGGCTGTACATGGATGAATGGCACTGG
 GTTCACCAAGACGTGTGGGGGGCCCCCGTGCAACATCGGGGGGGCCGGCAACAACACCTT

Figure 21F



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GACCTGCCCCACTGACTGTTTTCGGAAGCACCCCGAGGCCACCTACGCCAGATGCGGTTTC
 TGGGCCCTGGCTGACACCTAGGTGTATGGTTCATTACCCATATAGGCTCTGGCACTACCC
 CTGCACTGTCAACTTCACCATCTTCAAGGTTAGGATGTACGTGGGGGGCGTGGAGCACAG
 GTTCGAAGCCGCATGCAATTGGACTCGAGGAGAGCGTTGTGACTTGGAGGACAGGGATAG
 ATCAGAGCTTAGCCCGCTGCTGCTGTCTACAACAGGTGATCGAGGGCAGACACCATCACC
 ACCATCACTAATAG

SEQ ID NO 41 (HCC143)

ATGGTGGGGAACCTGGGCTAAGGTTTTGGTTGTGATGCTACTCTTTGCCGGCGTTCGACGGG
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 AGCCCCGGGTTCGGCTCAGAAAATCCAGCTCGTAAACACCAACGGCAGTTGGCACATCAAC
 AGGACTGCCCTGAACTGCAACGACTCCCTCCAAACAGGGTTCTTTGCCGCACTATTCTAC
 AAACACAAATTCAACTCGTCTGGATGCCAGAGCGCTTGGCCAGCTGTGCTCCATCGAC
 AAGTTCGCTCAGGGGTGGGGTCCCTCACTTACACTGAGCCTAACAGCTCGGACCAGAGG
 CCCTACTGCTGGCACTACGCGCCTCGACCGTGTGGTATTGTACCCGCGTCTCAGGTGTGC
 GGTCCAGTGTATTGCTTCACCCCGAGCCCTGTTGTGGTGGGGACGACCGATCGGTTTGGT
 GTCCCCACGTATAACTGGGGGGCGAACGACTCGGATGTGCTGATTCTCAACAACACGCGG
 CCGCCGCGAGGCAACTGGTTTCGGCTGTACATGGATGAATGGCACTGGGTTTCACCAAGACG
 TGTGGGGGGCCCCCGTGCAACATCGGGGGGGCCGGCAACAACACCTTGACCTGCCCCACT
 GACTGTTTTTCGGAAGCACCCCGAGGCCACCTACGCCAGATGCGGTTCTGGGCCCTGGCTG
 ACACCTAGGTGTATGGTTCATTACCCATATAGGCTCTGGCACTACCCCTGCACTGTCAAC
 TTCACCATCTTCAAGGTTAGGATGTACGTGGGGGGCGTGGAGCACAGGTTTGAAGCCGCA
 TGCAATTGGACTCGAGGAGAGCGTTGTGACTTGGAGGACAGGGATAGATCAGAGCTTAGC
 CCGCTGCTGCTGTCTACAACAGAGTGGCAGAGCTTAATTAATTAG

SEQ ID NO 43 (HCC144)

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 AAGTTCGCTCAGGGGTGGGGTCCCTCACTTACACTGAGCCTAACAGCTCGGACCAGAGG
 CCCTACTGCTGGCACTACGCGCCTCGACCGTGTGGTATTGTACCCGCGTCTCAGGTGTGC
 GGTCCAGTGTATTGCTTCACCCCGAGCCCTGTTGTGGTGGGGACGACCGATCGGTTTGGT
 GTCCCCACGTATAACTGGGGGGCGAACGACTCGGATGTGCTGATTCTCAACAACACGCGG
 CCGCCGCGAGGCAACTGGTTTCGGCTGTACATGGATGAATGGCACTGGGTTTCACCAAGACG
 TGTGGGGGGCCCCCGTGCAACATCGGGGGGGCCGGCAACAACACCTTGACCTGCCCCACT
 GACTGTTTTTCGGAAGCACCCCGAGGCCACCTACGCCAGATGCGGTTCTGGGCCCTGGCTG
 ACACCTAGGTGTATGGTTCATTACCCATATAGGCTCTGGCACTACCCCTGCACTGTCAAC
 TTCACCATCTTCAAGGTTAGGATGTACGTGGGGGGCGTGGAGCACAGGTTTGAAGCCGCA
 TGCAATTGGACTCGAGGAGAGCGTTGTGACTTGGAGGACAGGGATAGATCAGAGCTTAGC

Figure 21G



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CCGCTGCTGCTGTCTACAACAGGTGATCGAGGGCAGACACCATCACCACCATCACTAATA

SEQ ID NO 45 (HCCL64)

ATGGTGGCGGGGGCCCATTGGGGAGTCCTGGCGGGCCTCGCCTACTATTCCATGGTGGGG
 AACTGGGCTAAGGTTTTGGTTGTGATGCTACTCTTTGCCGGCGTCGACGGGCATACCCGC
 GTGTCAGGAGGGGCAGCAGCCTCCGATACCAGGGGCCTTGTGTCCCTCTTTAGCCCCGGG
 TCGGCTCAGAAAATCCAGCTCGTAAACACCAACGGCAGTTGGCACATCAACAGGACTGCC
 CTGAACTGCAACGACTCCCTCCAAACAGGGTTCTTTGCCGCACTATTCTACAAACACAAA
 TTCAACTCGTCTGGATGCCAGAGCGCTTGGCCAGCTGTGCTCCATCGACAAGTTGCT
 CAGGGGTGGGGTCCCCTCACTTACACTGAGCCTAACAGCTCGGACCAGAGGCCCTACTGC
 TGGCACTACGCGCCTCGACCGTGTGGTATTGTACCCGCGTCTCAGGTGTGCGGTCCAGTG
 TATTGCTTACCCCGAGCCCTGTTGTGGTGGGGACGACCGATCGGTTTGGTGTCCCCACG
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 GGCAACTGGTTCGGCTGTACATGGATGAATGGCACTGGGTTACCAAGACGTGTGGGGGC
 CCCCCGTGCAACATCGGGGGGGCCGGCAACAACACCTTGACCTGCCCACTGACTGTTTT
 CGGAAGCACCCCGAGGCCACCTACGCCAGATGCGGTTCTGGGCCCTGGCTGACACCTAGG
 TGTATGGTTCATTACCCATATAGGCTCTGGCACTACCCCTGCACTGTCAACTTCACCATC
 TTCAAGGTTAGGATGTACGTGGGGGGCGTGGAGCACAGGTTCGAAGCCGCATGCAATTGG
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SEQ ID NO 47 (HCC165)

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 TGCTGGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCGTCCCCACCACGACA
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 GGGGACCTCTGCGGATCTGTCTTCTCGTCTCCAGCTGTTACCATCTCGCCTCGCCGG
 CATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCCGGCCACATAACGGGTACCCGT
 ATGGCTTGGGATATGATGATGAACTGGTTCGCTACAACGGCCCTGGTGGTATCGCAGCTG
 CTCCGGATCCCACAAGCTGTGCTGGACATGGTGGCGGGGGCCATTGGGGAGTCCTGGCG

Figure 21H



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GGCCTCGCCTACTATTCCATGGTGGGGAAC TGGGCTAAGGTTTTGGTTGTGATGCTACTC
 TTTGCCGGCGTCGACGGGCATACCGCGTGT CAGGAGGGGCAGC AGCCTCCGATACCAG
 GGGCCTTGTGTCCCTCTTTAGCCCCGGGT CCGCTCAGAAAATCCAGCTCGTAAACACCAA
 CGGCAGTTGGCACATCAACAGGACTGCCCTGA ACTGCAACGACTCCCTCCAAACAGGGTT
 CTTTGCCGCACTATTCTACAAACACAAATTCA ACTCGTCTGGATGCCAGAGCGCTTGGC
 CAGCTGTGCTCCATCGACAAGTTTCGCTCAG GGGTGGGGTCCCCTCACTTACACTGAGCC
 TAACAGCTCGGACCAGAGGCCCTACTGCTGG CACTACGCGCTCGACCGTGTGGTATTGT
 ACCCGCGTCTCAGGTGTGCGGTCCAGTGTAT TGCTTACCCCGAGCCCTGTTGTGGTGGG
 GACGACCGATCGGTTTGGTGTCCCCACGTATA ACTGGGGGGCGAACGACTCGGATGTGCT
 GATTCTCAACAACACGCGGCCGCCGAGGCAACT GGTTCGGCTGTACATGGATGAATGG
 CACTGGGTTCACCAAGACGTGTGGGGGCCCCCG TGCAACATCGGGGGGGCCGGCAACAA
 CACCTTGACCTGCCCCACTGACTGTTTTTCGGA AGCACCCCGAGGCCACCTACGCCAGATG
 CGGTTCTGGGCCCTGGCTGACACCTAGGTGTAT GGTTCATTACCCATATAGGCTCTGGCA
 CTACCCCTGCACTGTCAACTTCAACCATCTTCA AGGTTAGGATGTACGTGGGGGGCGTGGA
 GCACAGGTTCGAAGCCGCATGCAATTGGACTCG AGGAGAGCGTTGTGACTTGGAGGACAG
 GGATAGATCAGAGCTTAGCCCGCTGCTGCTGTCT ACAACAGAGTGGCAGATACTGCCCTG
 TTCCTTACCCACCCCTGCCGGCCCTATCCACCG GCCTGATCCACCTCCATCAGAACATCGT
 GGACGTGCAATACCTGTACGGTGTAGGGTGGCG GTTGTCTCCCTTGTATCAAATGGGA
 GTATGTCTGTGCTCTTCTTCTCCTGGCAGACGC GCGCATCTGCGCCTGCTTATGGAT
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SEQ ID NO 49 (HCC166)

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 AGGCGACAACCTATCCCCAAGGCTCGCCGACCCGAG GGTAGGGCTGGGCTCAGCCCGGG
 TACCCTTGGCCCTCTATGGCAATGAGGGCATGGGGT GGGCAGGATGGCTCCTGTACCC
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 GCGCCCCCCTAGGGGGCGCTGCCAGGGCCCTGGCGCA TGCGGTCCGGGTTCTGGAGGAC
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 TTGCTGTCTGTCTGACCGTTCCAGCTTCCGCTTATGA AGTGCGCAACGTGTCCGGGATG
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 ATGCACACCCCCGGGTGCGTGCCCTGCGTTGCGGAGA ACAAACCTTCCCGCTGCTGGGTA
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 TGCGGATCTGTCTTCTCGTCTCCAGCTGTTACCATCTC GCCTCGCCGGCATGAGACG
 GTGCAGGACTGCAATTGCTCAATCTATCCCGGCCACATA ACGGGTACCGTATGGCTTGG

Figure 211



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ATATGATGATGAACTGGTCGCTACAACGGCCCTGGTGGTATCGCAGCTGCTCCGGATC
CCACAAGCTGTCGTGGACATGGTGGCGGGGGGCCATTGGGGAGTCCTGGCGGGCCTCGCC
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GACCAGAGGCCCTACTGCTGGCACTACGCGCCTCGACCGTGTGGTATTGTACCCGCGTCT
CAGGTGTGCGGTCCAGTGTATTGCTTACCCCGAGCCCTGTTGTGGTGGGGACGACCGAT
CGGTTTGGTGTCCCCACGTATAACTGGGGGGCGAACGACTCGGATGTGCTGATTCTCAAC
AACACGCGGCCCGCCGCGAGGCAACTGGTTCGGCTGTACATGGATGAATGGCACTGGGTTT
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TGCCCCACTGACTGTTTTTCGGAAGCACCCCGAGGCCACCTACGCCAGATGCGGTTCTGGG
CCCTGGCTGACACCTAGGTGTATGGTTCATTACCCATATAGGCTCTGGCACTACCCCTGC
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ATAGCTCAAGCTGAGGCCGCTTAGAGAACCTGGTGGTCTCAATGCGGCGGCCGTGGCC
GGGGCGCATGGCACTCTTCTCTTCTTGTGTTCTTCTGTGCTGCCTGGTACATCAAGGGC
AGGCTGGTCCCTGGTGCAGCATACGCCTTCTATGGCGTGTGGCCGCTGCTCCTGCTTCTG
CTGGCCTTACCACCACGAGCTTATGCCTAGTAA

Figure 21J



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OD measured at 450nm
 construct

Fraction	Volume	dilution	39 type 1b	40 type 1b	62 type 3a	63 type 5a
Start	23ml	1/20	2.517	1.954	1.426	1.142
Flow through	23ml	1/20	0.087	0.085	0.176	0.120
1	0.4ml	1/200	0.102	0.051	0.048	0.050
2			0.396	0.550	0.090	0.067
3			2.627	2.603	2.481	2.372
4			3	2.967	3	2.694
5			3	2.810	2.640	2.154
6			2.694	2.499	1.359	1.561
7			2.408	2.481	0.347	1.390
8			2.176	1.970	1.624	0.865
9			1.461	1.422	0.887	0.604
10			1.286	0.926	0.543	0.519
11			0.981	0.781	0.294	0.294
12			0.812	0.650	0.249	0.199
13			0.373	0.432	0.239	0.209
14			0.653	0.371	0.145	0.184
15			0.441	0.348	0.151	0.151
16			0.321	0.374	0.098	0.106
17			0.525	0.186	0.099	0.108
18			0.351	0.171	0.083	0.090
19			0.192	0.164	0.084	0.087

Figure 22



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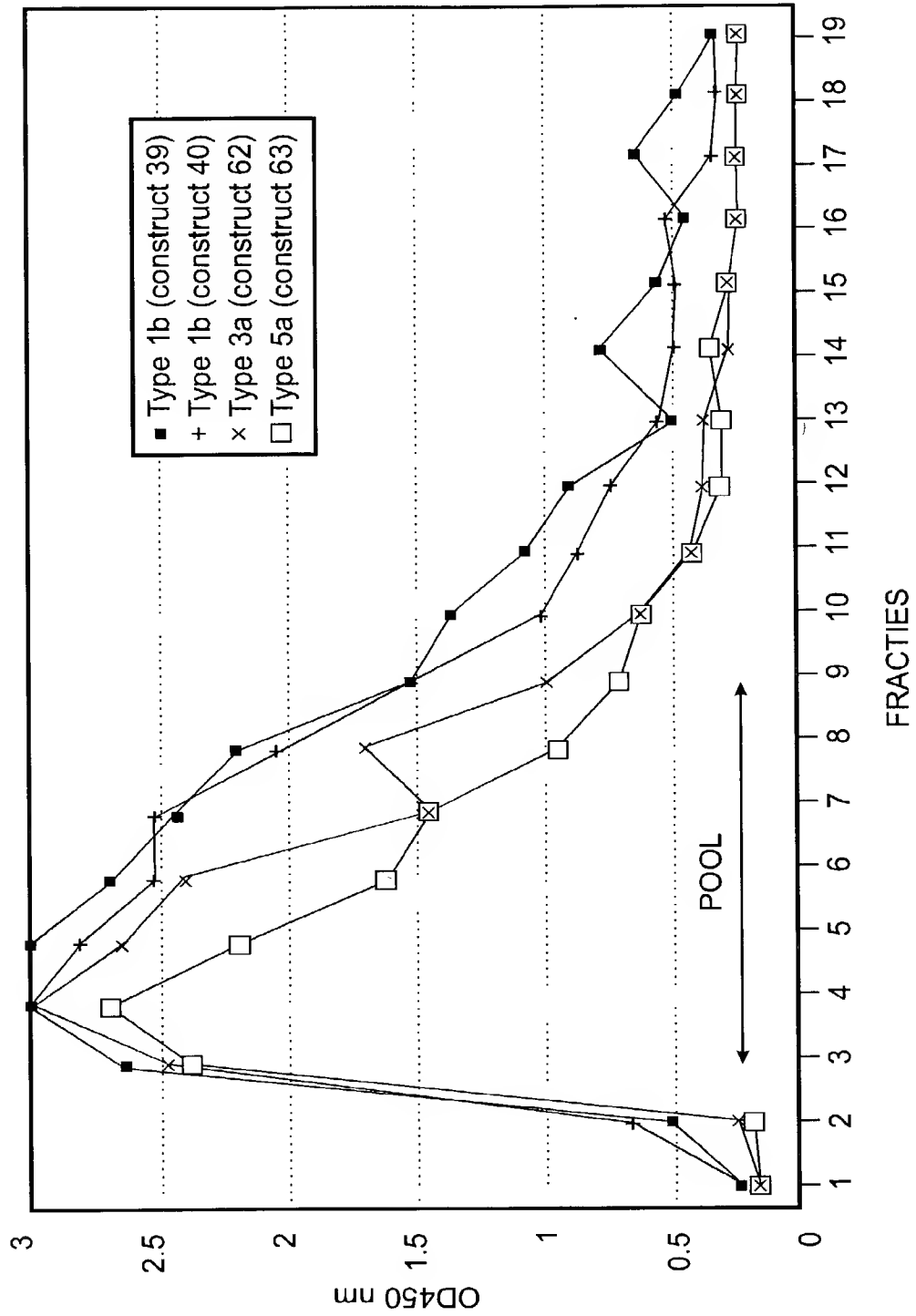


Figure 23



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OD measured at 450nm
 construct

Fraction	Volume	dilution	39 type 1b	40 type 1b	62 type 3a	63 type 5a
20	250µl	1/200	0.072	0.130	0.096	0.051
21			0.109	0.293	0.084	0.052
22			0.279	0.249	0.172	0.052
23			0.093	0.151	0.297	0.054
24			0.080	0.266	0.438	0.056
25			0.251	0.100	0.457	0.048
26			3	1.649	0.722	0.066
27			3	3	2.528	0.889
28			3	3	3	2.345
29			3	3	2.849	2.580
30			2.227	1.921	1.424	1.333
31			0.263	0.415	0.356	0.162
32			0.071	0.172	0.154	0.064
33			0.103	0.054	0.096	0.057
34			0.045	0.045	0.044	0.051
35			0.043	0.047	0.045	0.046
36			0.045	0.045	0.049	0.040
37			0.045	0.047	0.046	0.048
38			0.046	0.048	0.047	0.057
39			0.045	0.048	0.050	0.057
40			0.046	0.049	0.048	0.049

Figure 24



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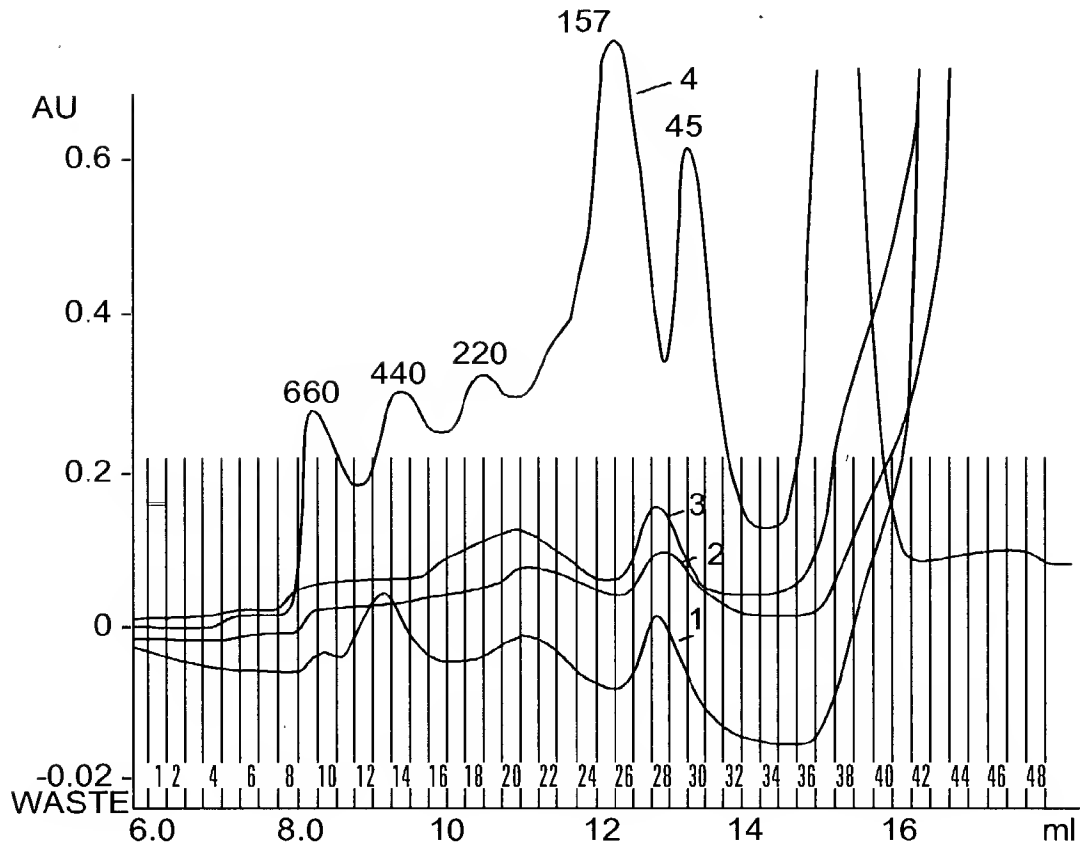


Figure 25



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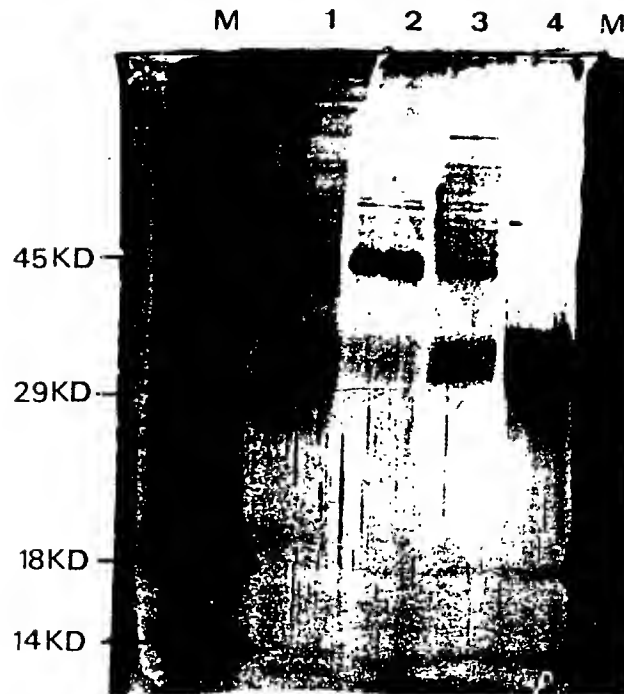


Fig. 26

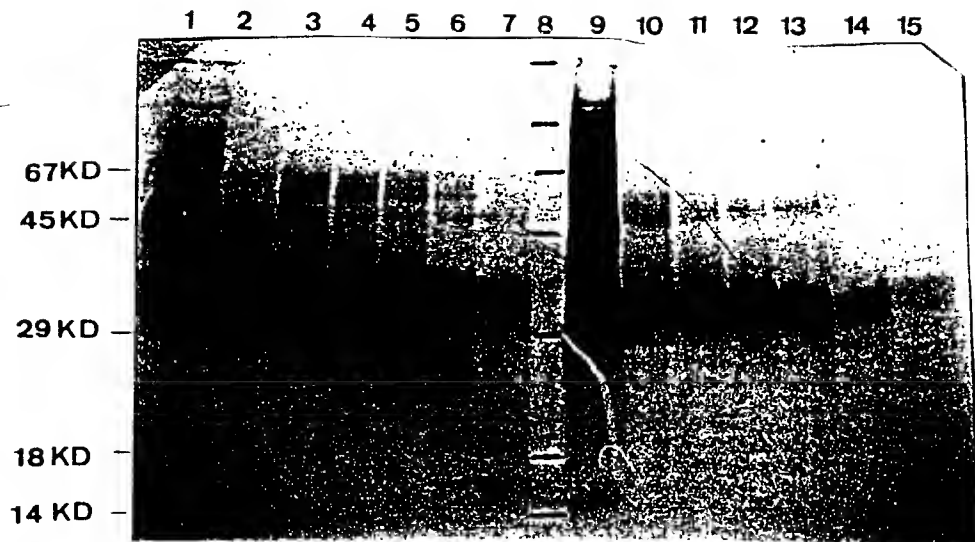


Fig. 27

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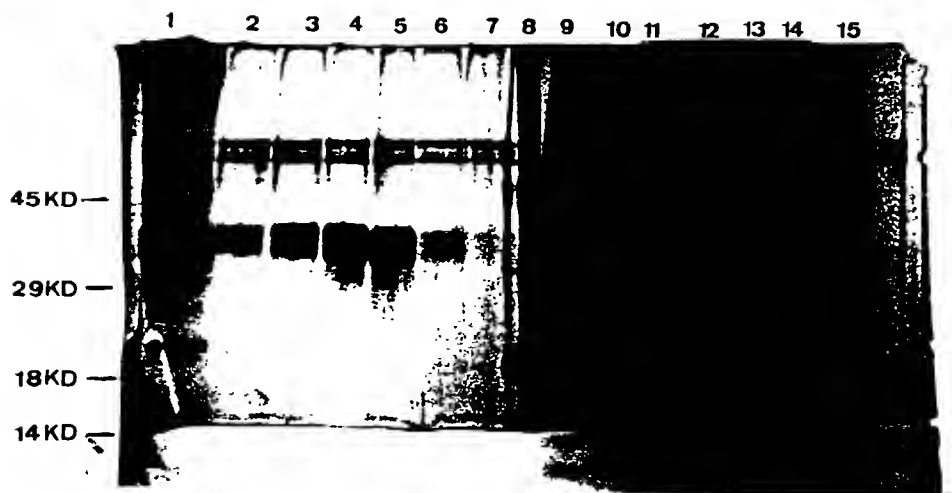


Fig.28

M 1 2 3 4 5 6

Fig.29

67 kD -

45 kD -

29 kD -

18 kD -

14 kD -

Lane 1: Crude Lysate
 Lane 2: Flow through Lentil Chromatography
 Lane 3: Wash with EMPIGEN Lentil Chromatography
 Lane 4: Eluate Lentil Chromatography
 Lane 5: Flow through during concentration lentil eluate
 Lane 6: Pool of EI after Size Exclusion Chromatography

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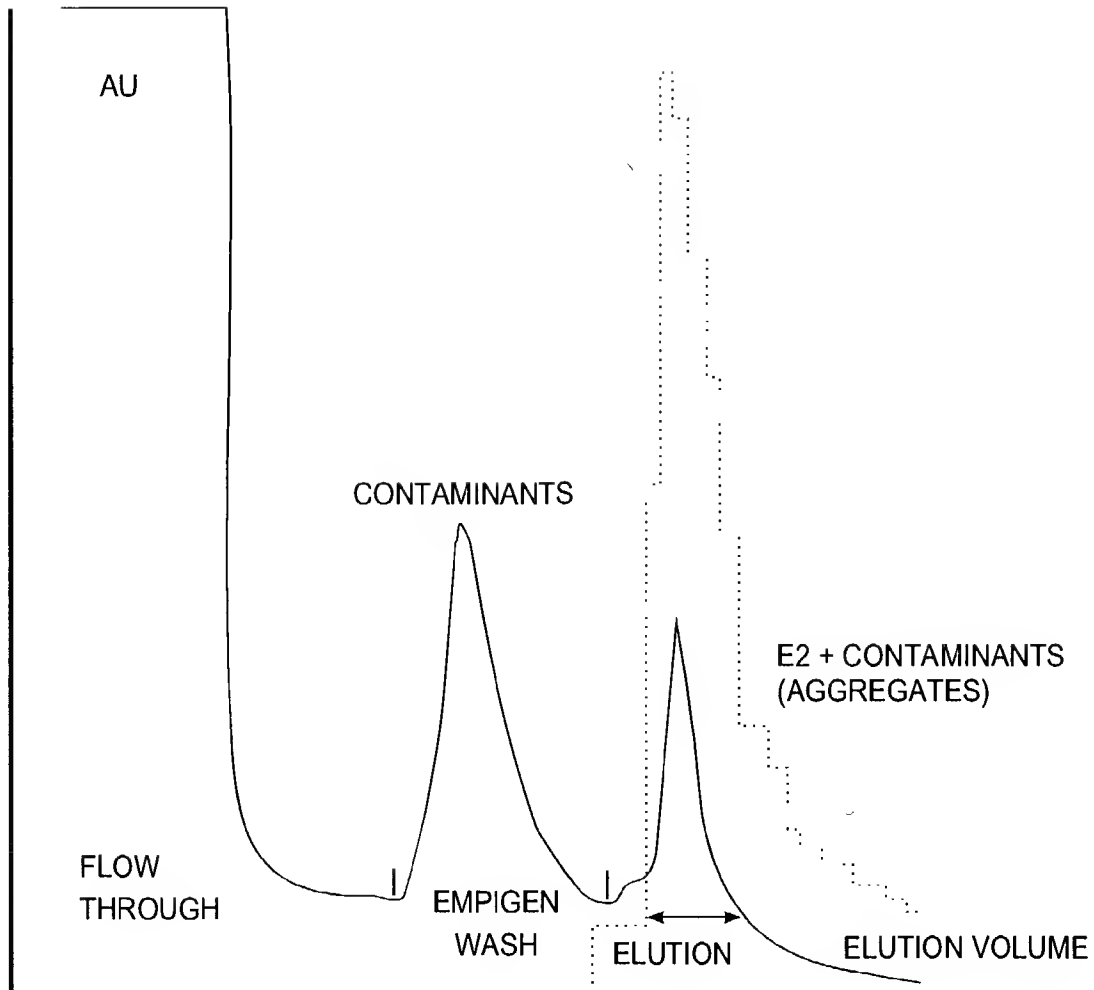


Figure 30

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NON-REDUCED

38 / 65

E2 + CONTAMINANTS (AGGREGATES)

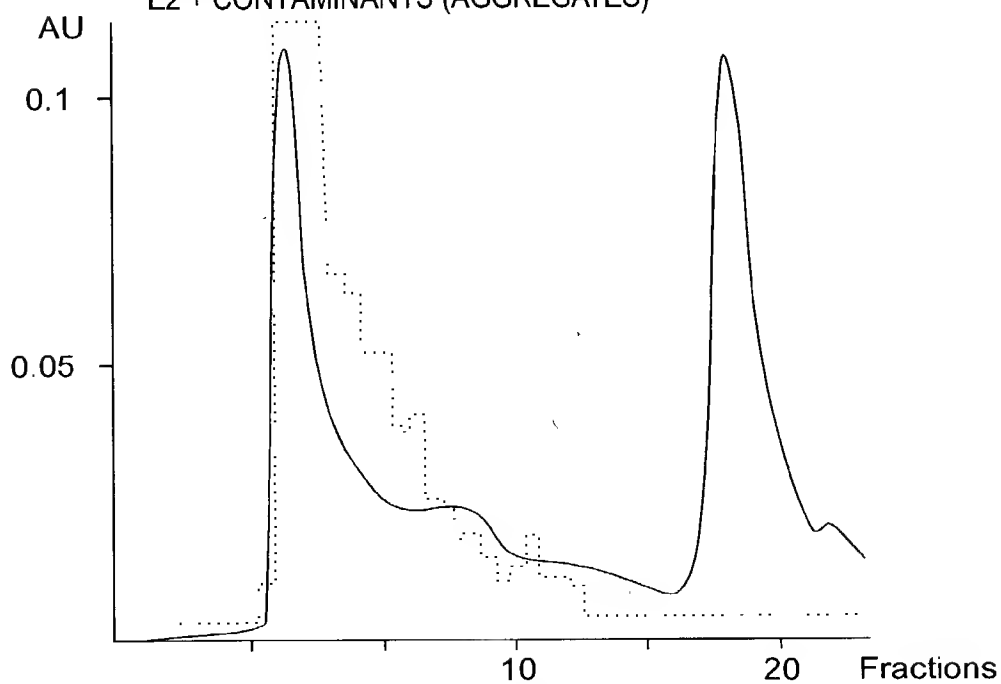


Figure 31A

REDUCED

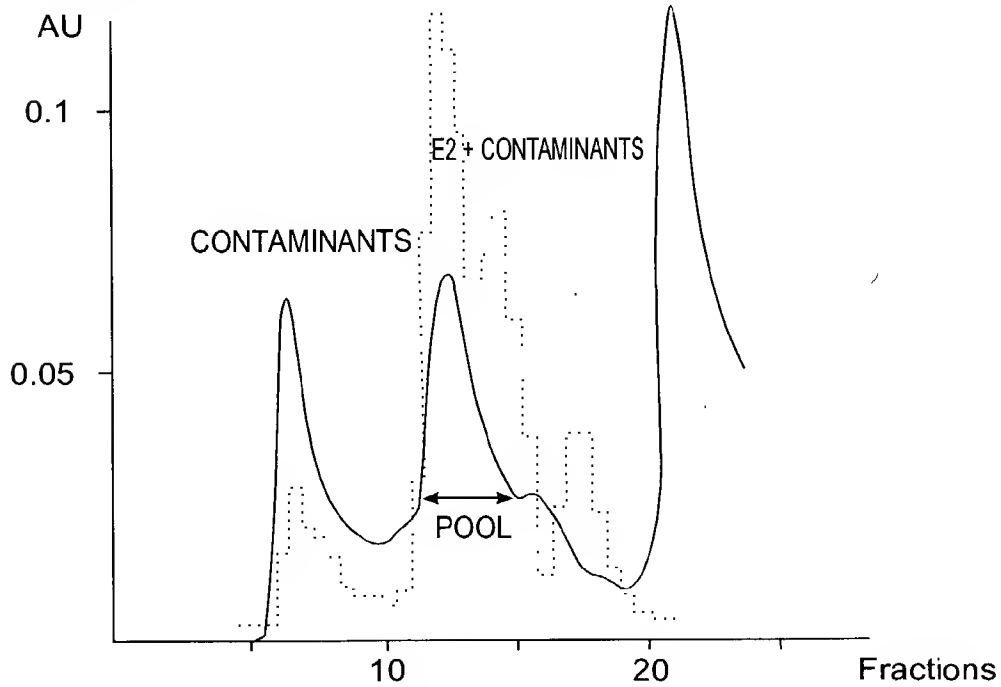


Figure 31B



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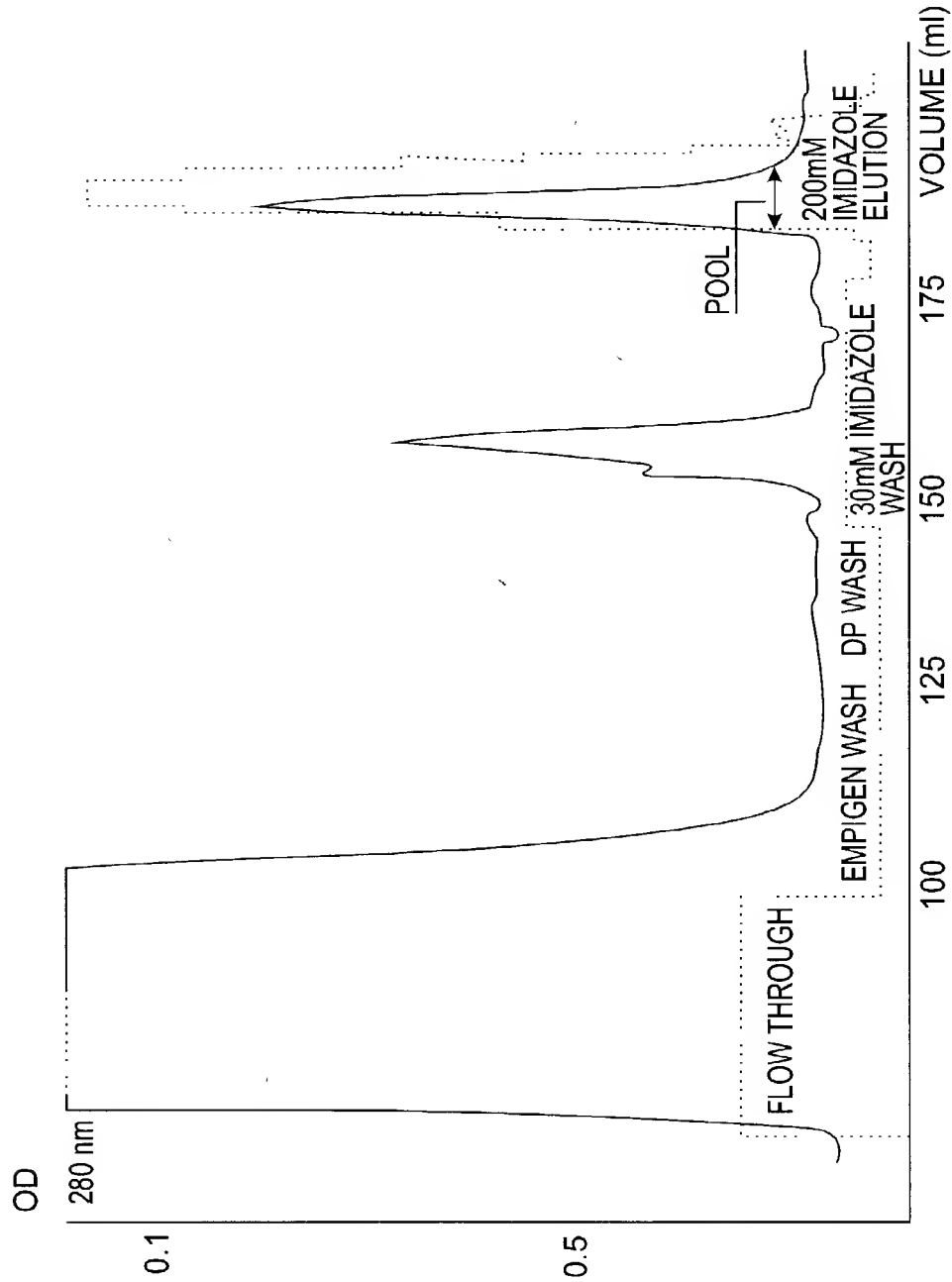
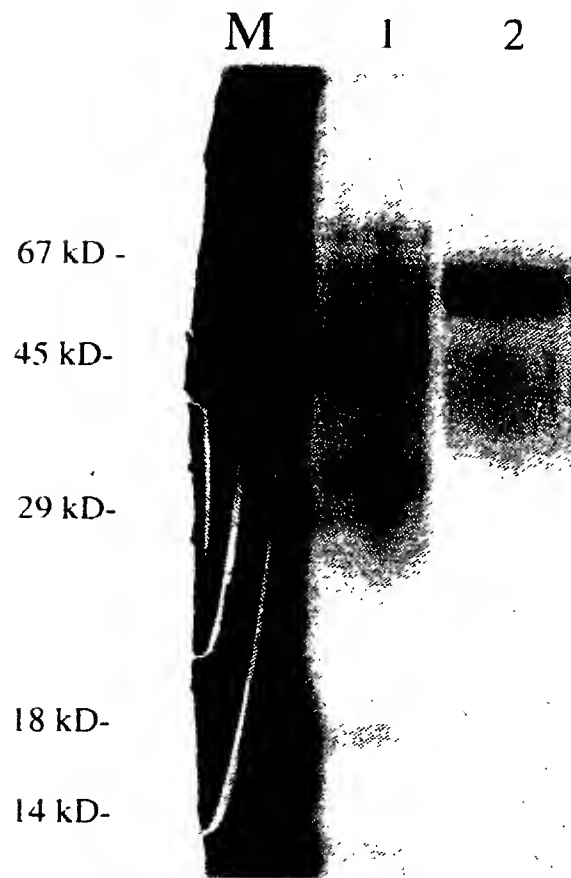


Figure 32

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SILVER STAIN OF PURIFIED E2

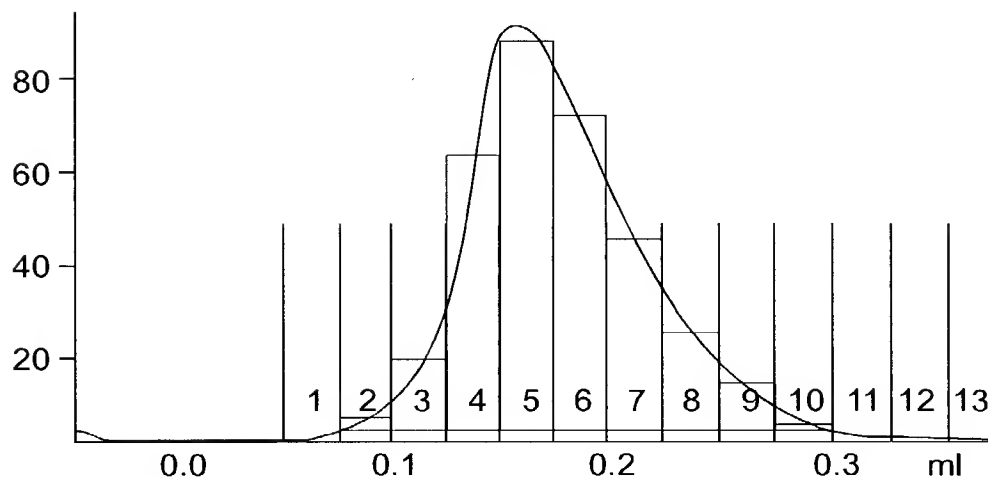


1. 30 mM IMIDAZOLE WASH Ni-IMAC
2. 0.5 ug E2

Fig.33



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No.	Ret (ml)	Peak start (ml)	Peak end (ml)	Dur (ml)	Area (ml*mAU)	Height (mAU)
1	-0.45	-0.46	-0.43	0.04	0.0976	4.579
2	1.55	0.75	3.26	2.51	796.4167	889.377
3	3.27	3.26	3.31	0.05	0.0067	0.224
4	3.33	3.32	3.33	0.02	0.0002	0.018

Total number of detected peaks = 4

Total Area above baseline = 0.796522 ml*AU

Total area in evaluated peaks = 0.796521 ml*AU

Ratio peak area / total area = 0.999999

Total peak duration = 2.613583 ml

Figure 34

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NS4 Ab NR

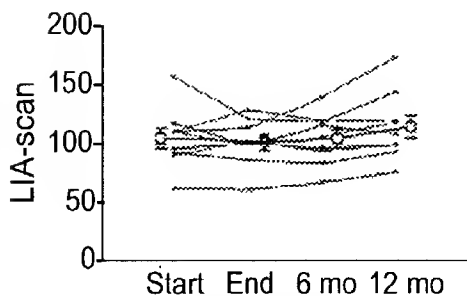


Fig. 35A-1

NS4 Ab LTR

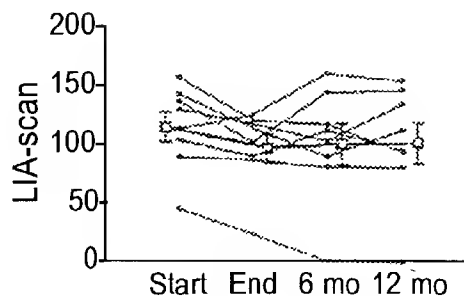


Fig. 35A-2

NS5 Ab NR

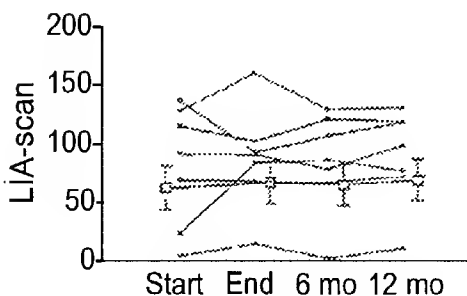


Fig. 35A-3

NS5 Ab LTR

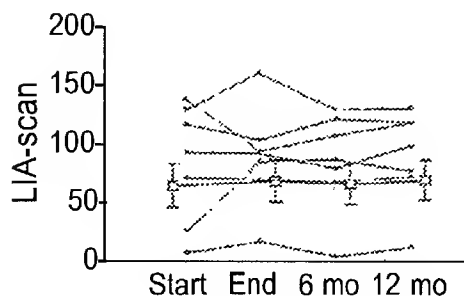


Fig. 35A-4

E1 Ab NR

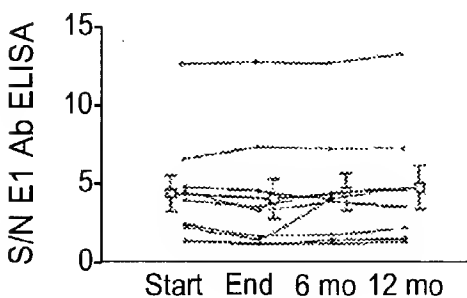


Fig. 35A-5

E1 Ab LTR

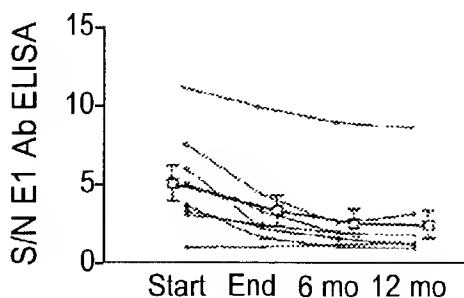


Fig. 35A-6

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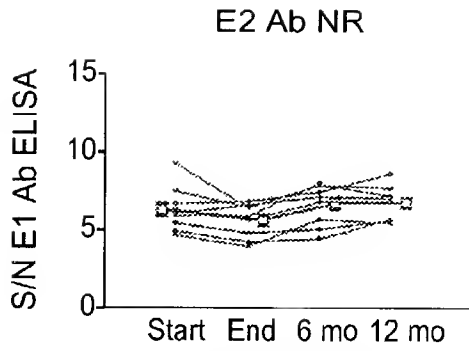


Fig. 35A-7

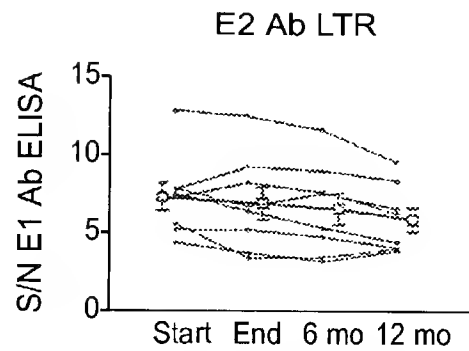


Fig. 35A-8



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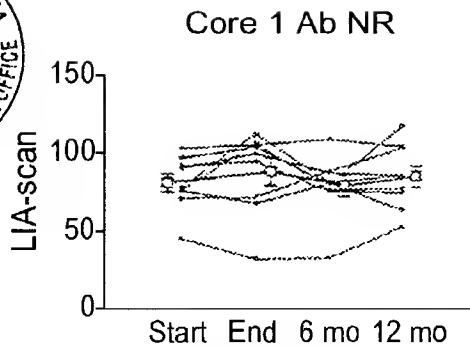


Fig. 35B-1

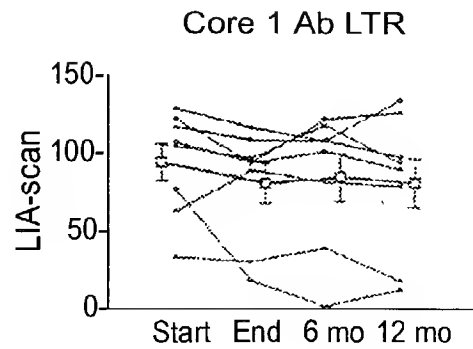


Fig. 35B-2

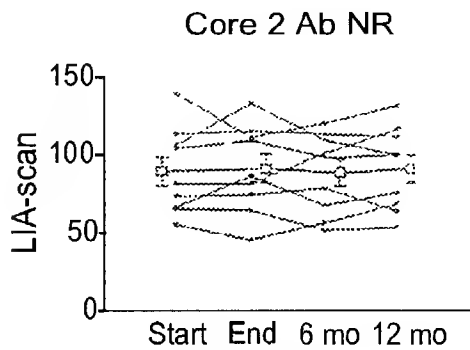


Fig. 35B-3

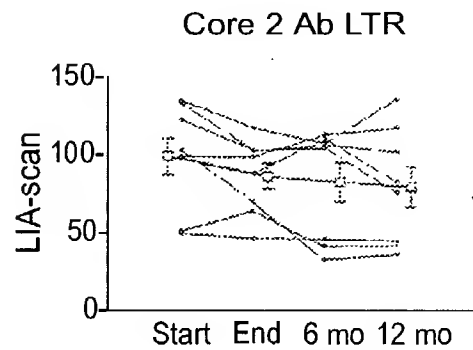


Fig. 35B-4

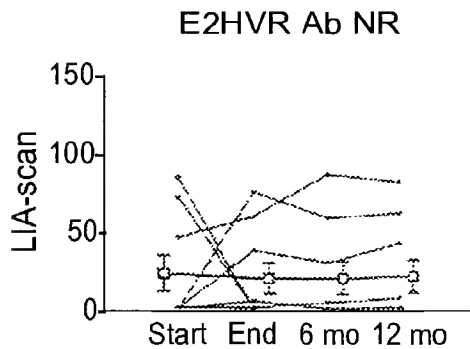


Fig. 35B-5

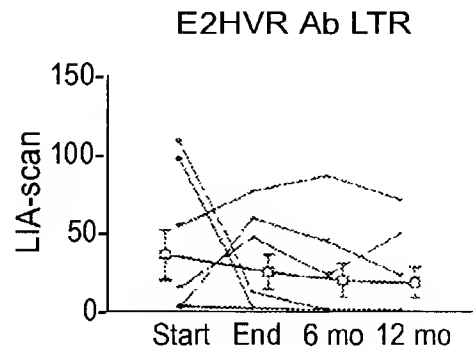


Fig. 35B-6

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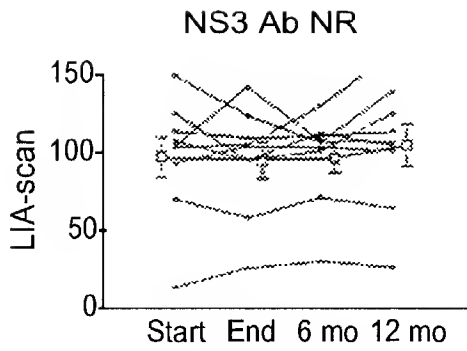


Fig. 35B-7

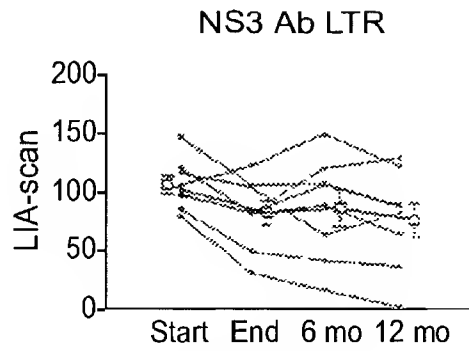


Fig. 35B-8

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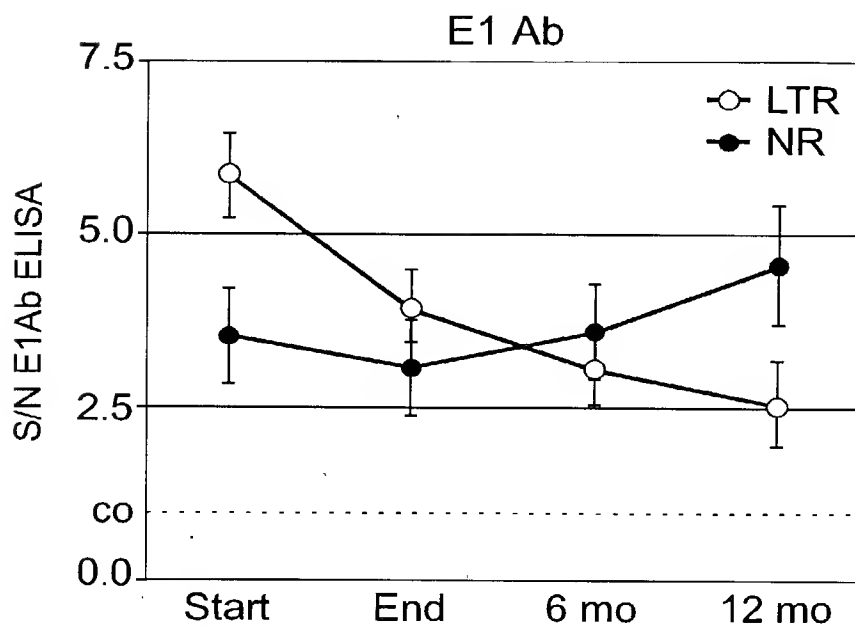


Figure 36A

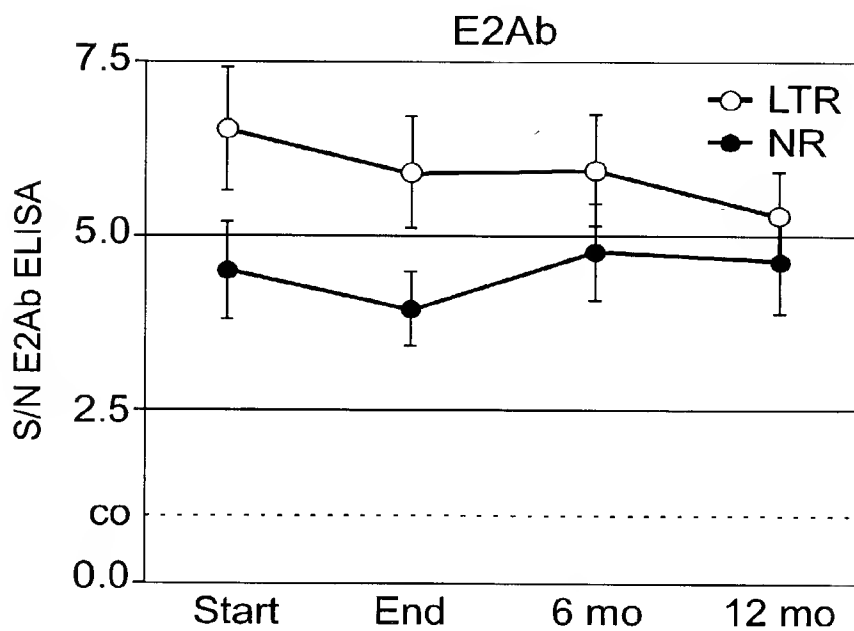


Figure 36B

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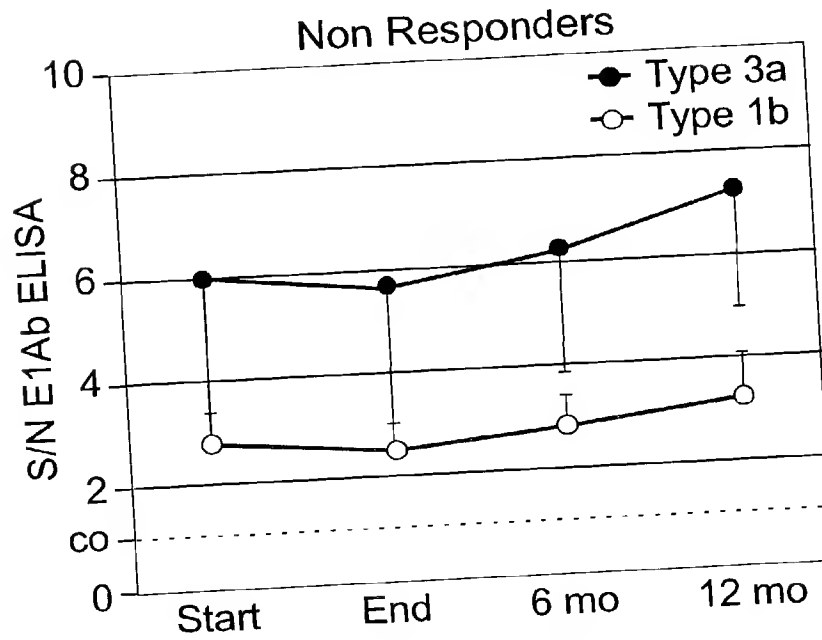


Figure 37A

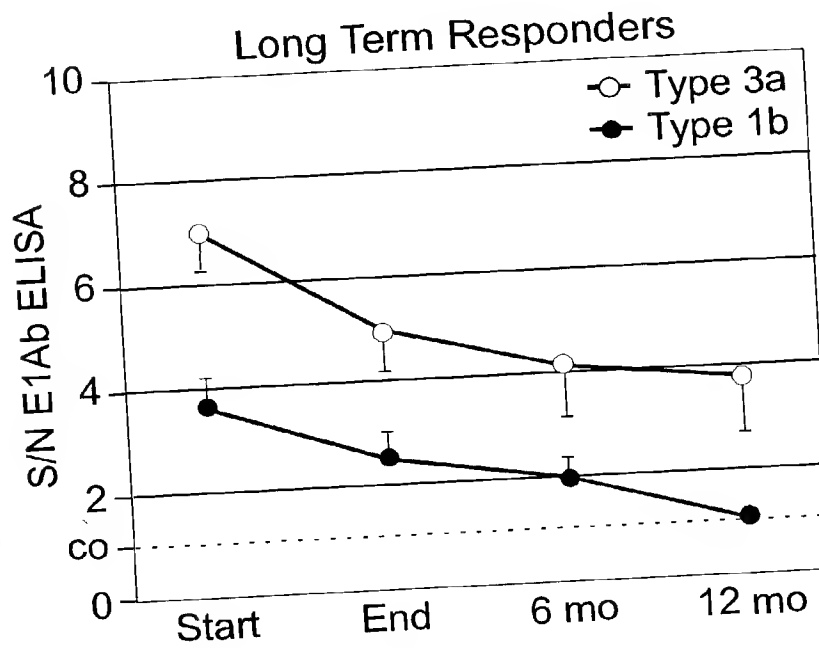


Figure 37B

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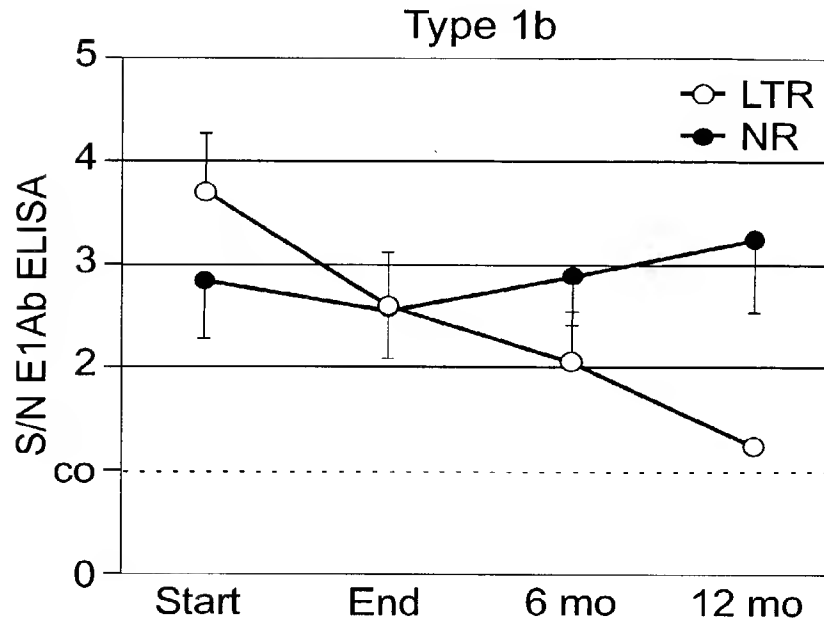


Figure 37C

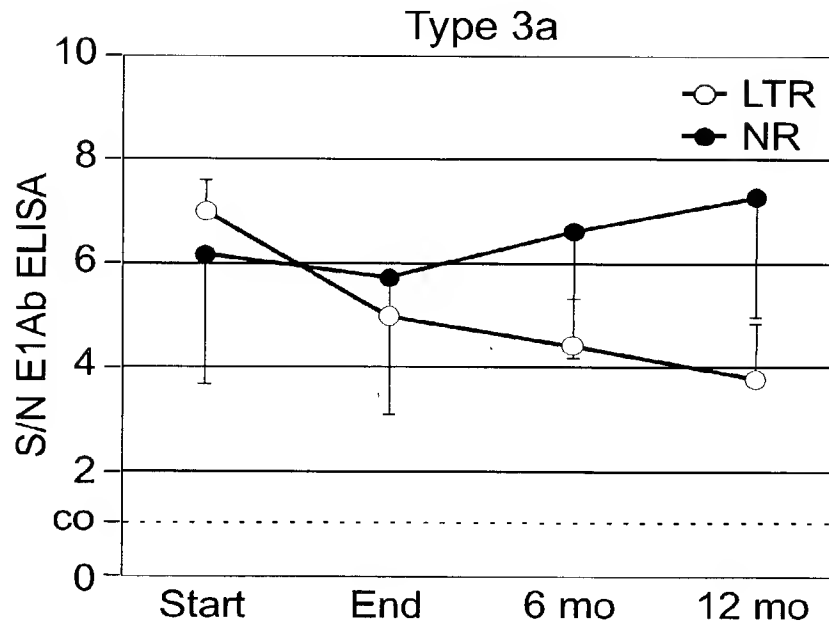


Figure 37D

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Relative Map Positions of
anti-E2 monoclonal antibodies

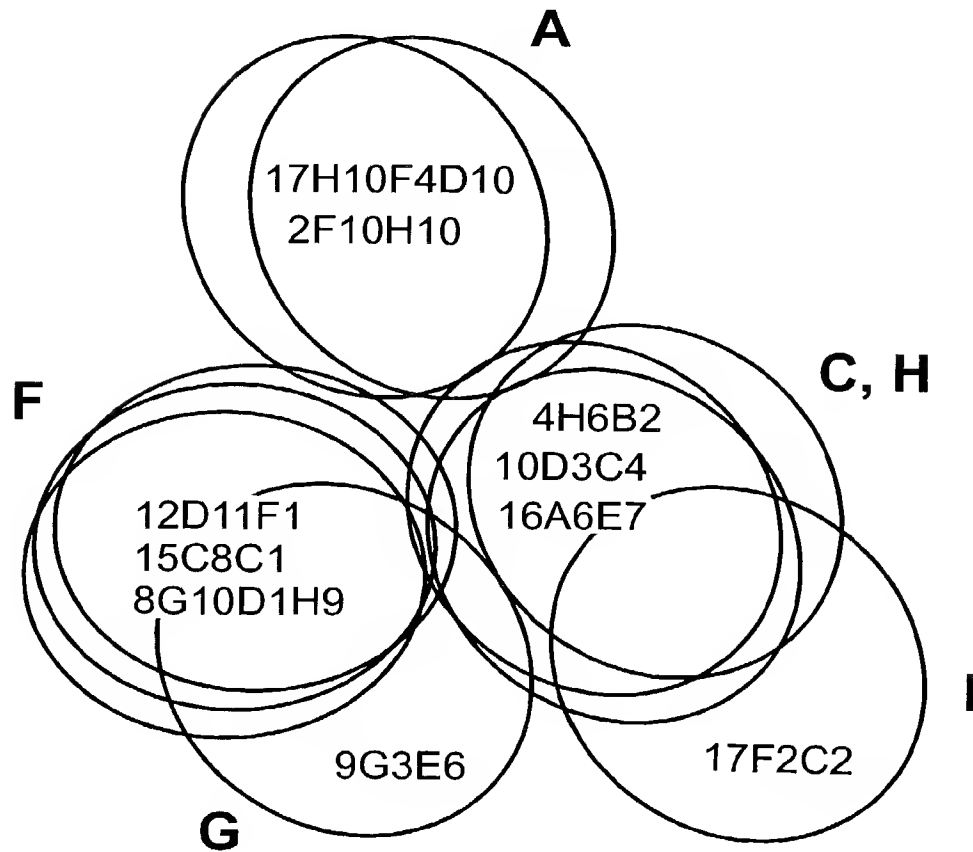


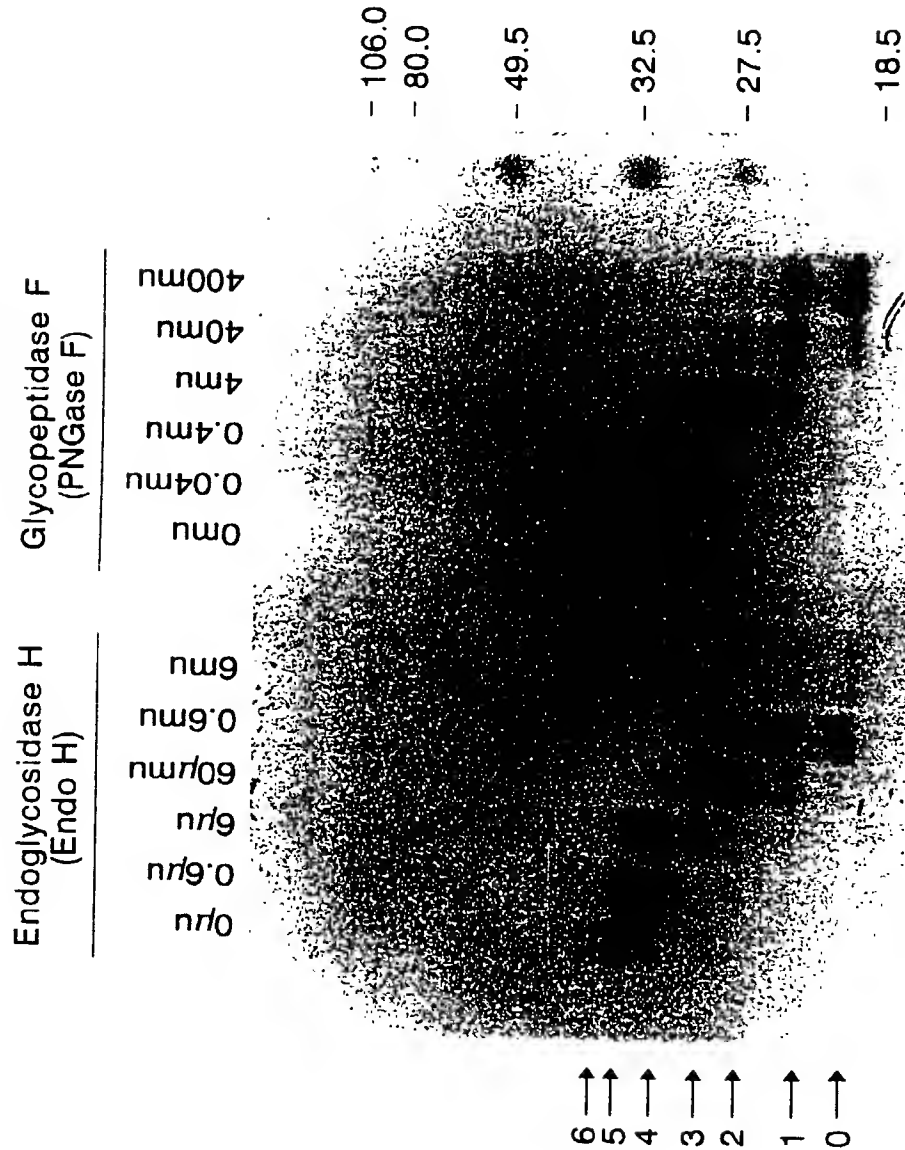
Figure 38

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Fig.39

**PARTIAL DEGLYCOSYLATION
 OF HCV E1 ENVELOPE PROTEIN**



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PARTIAL TREATMENT OF HCV E2\E2s ENVELOPE PROTEINS BY PNGase F

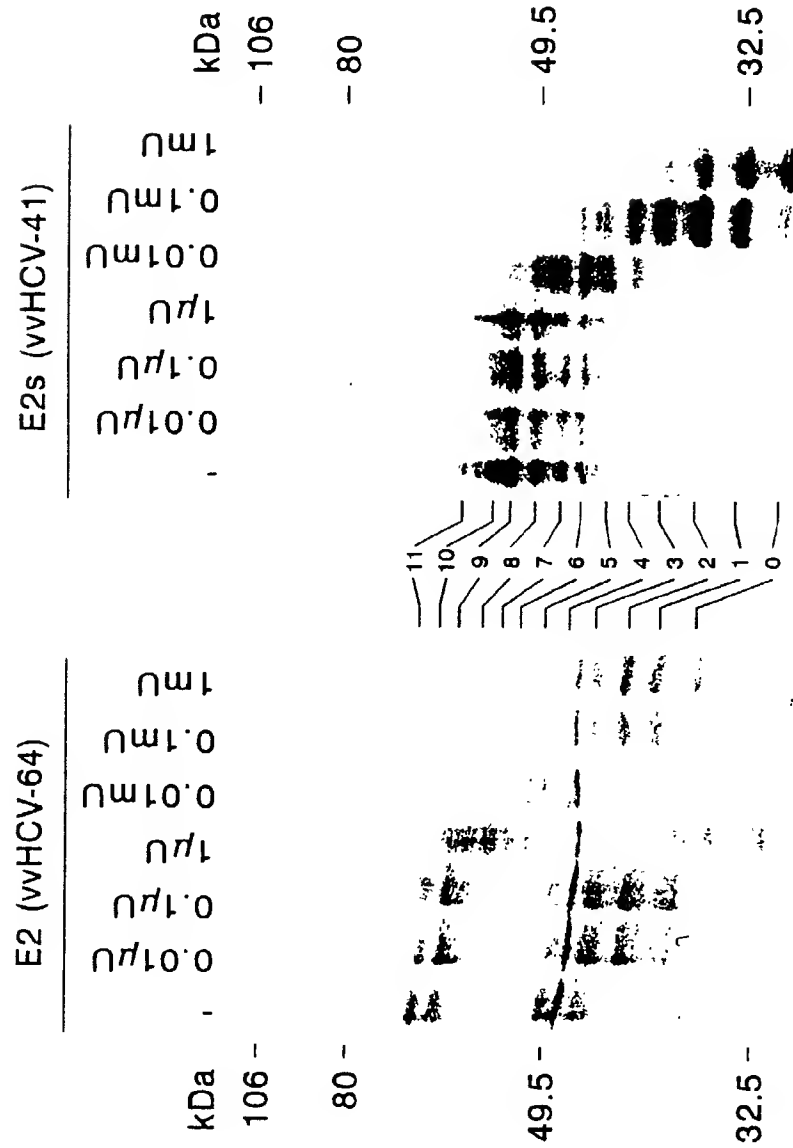


Fig. 40



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In vitro mutagenesis of HCV E1 glycoprotein

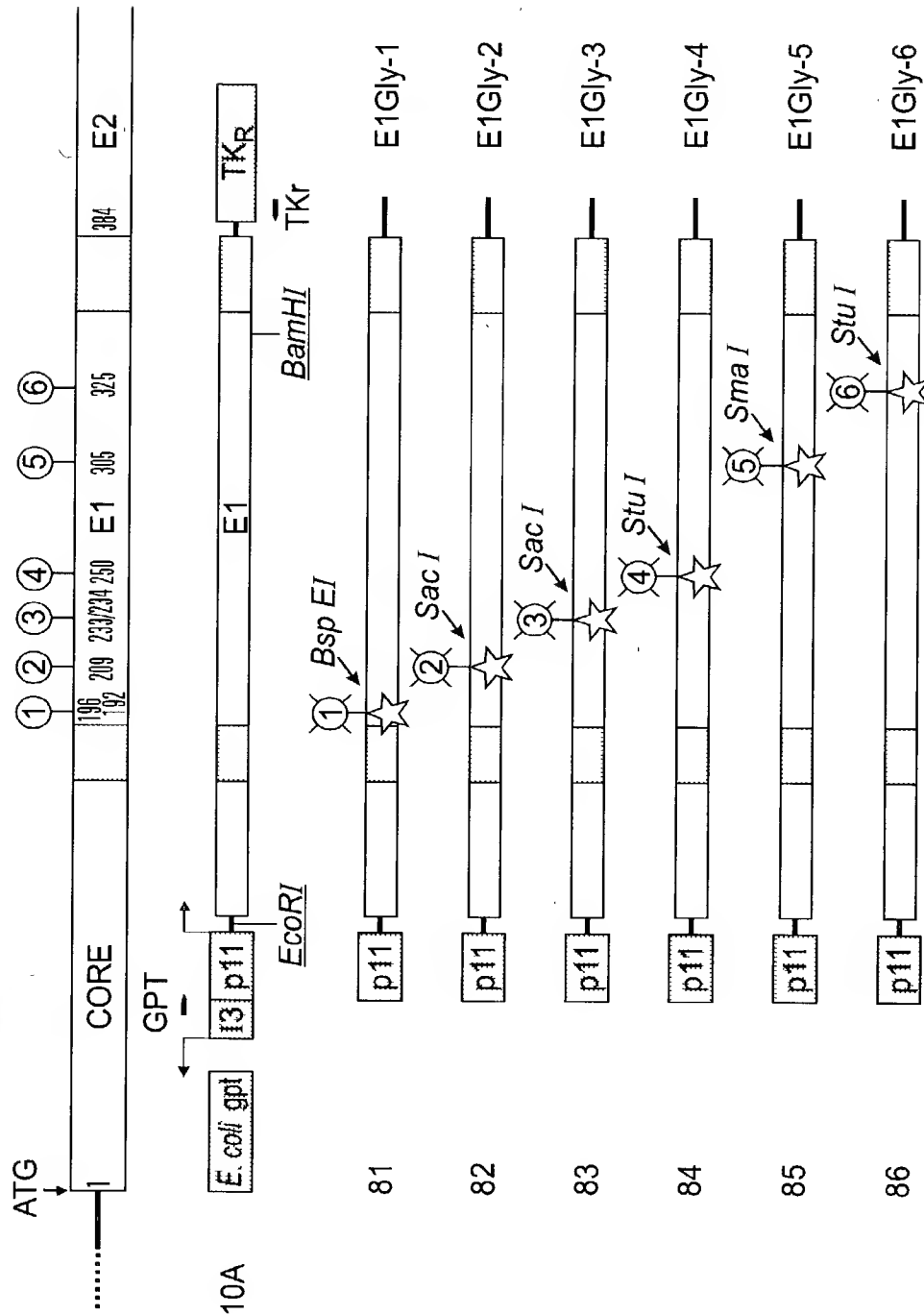


Figure 41



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In vitro mutagenesis of HCV E1 glycoprotein

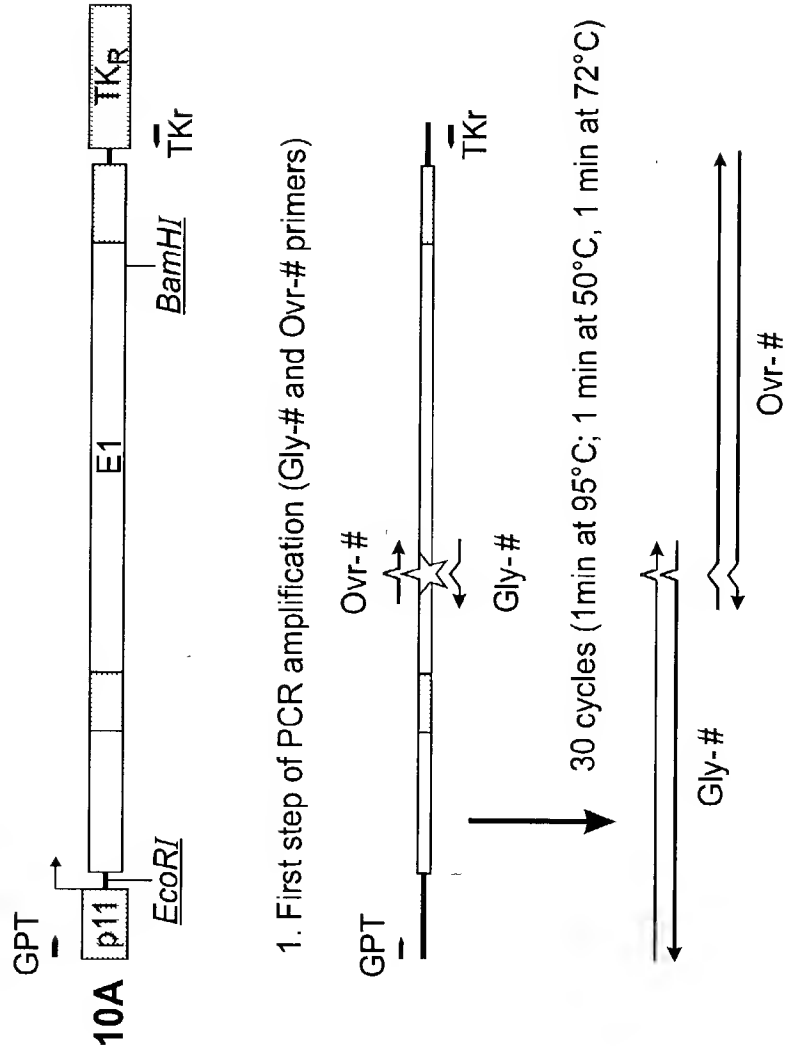


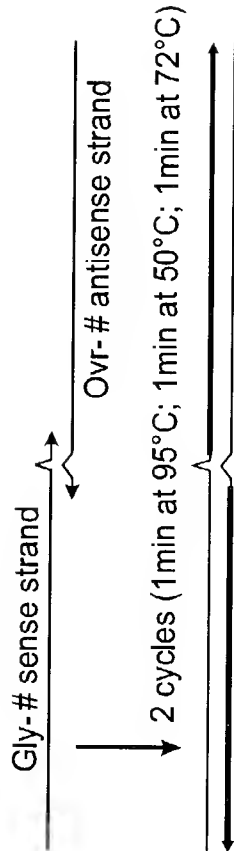
Figure 42A

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2. Overlap extension and nested PCR

a. Overlap extension



b. Nested PCR amplification (GPT-2 and TKr-2 primers)

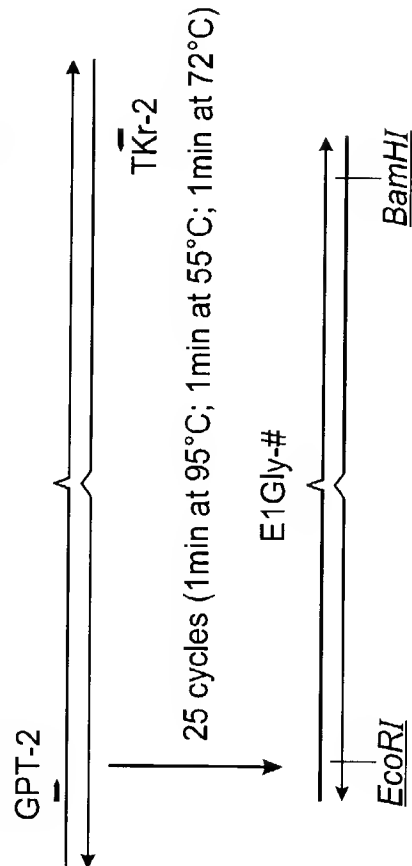


Figure 42B



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In vitro mutagenesis of HCV E1 glycoprotein

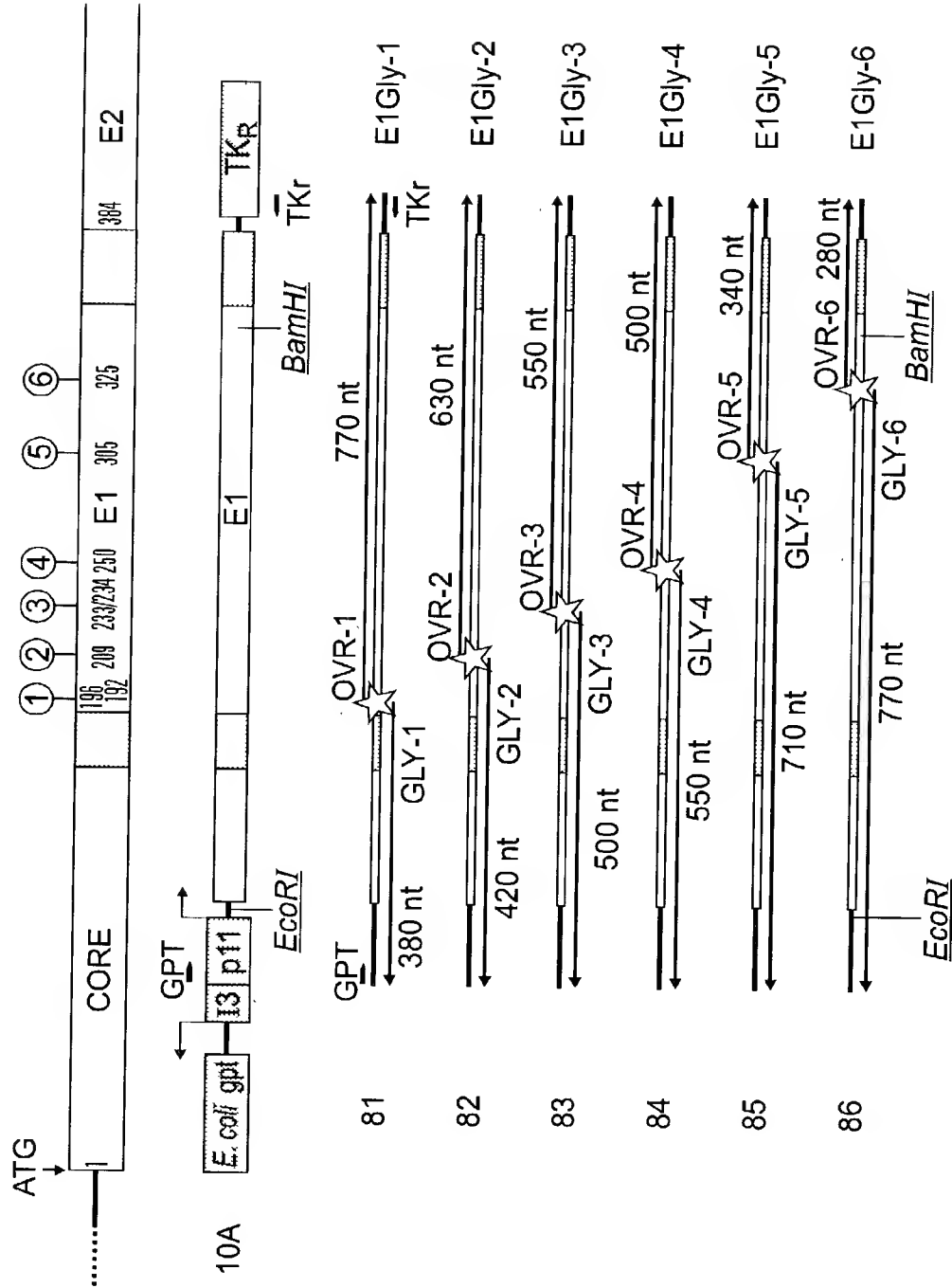


Figure 43

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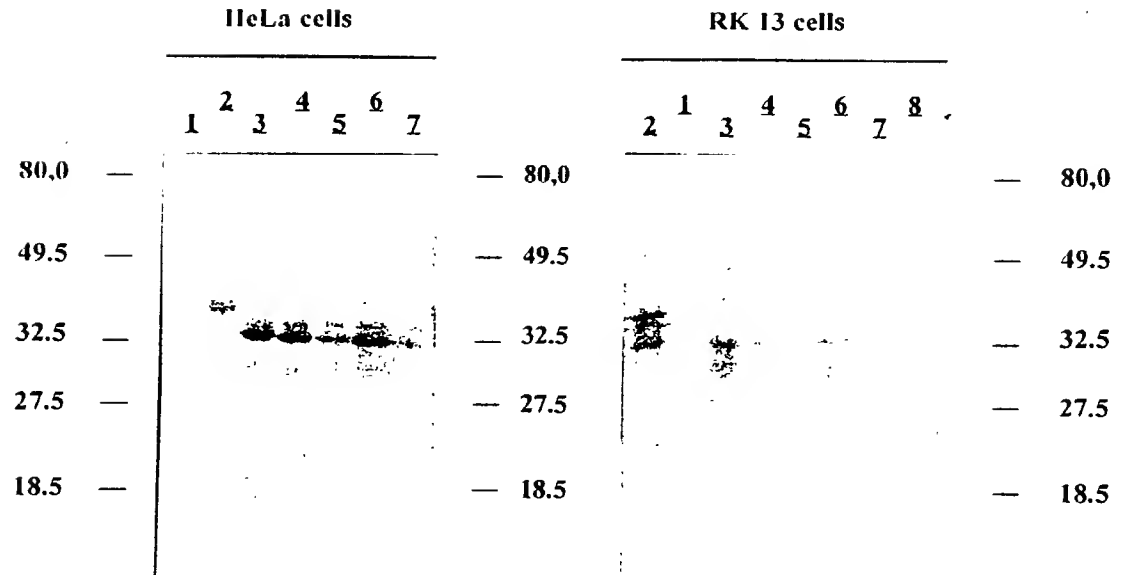


Fig. 44A



Fig. 44B

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Fig.45

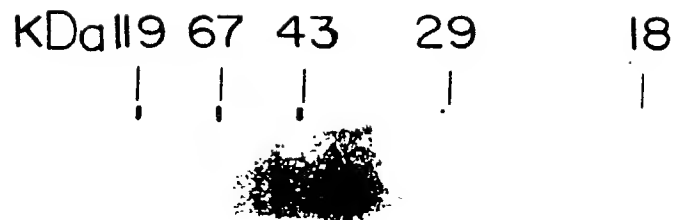


Fig.46

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	age (years)	HCV infection (years)	genotype
Marcel	17	9	1a
Peggy	21	16,5	1b
Femma	15	9	1a
Yoran	12	none	
Marti	12	none	

chronic carriers (strong T-cell adjuvant)

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ 50 µg E1 dose

0 3 6 9 12 15 26 29 32 35 38 41 weeks

naive (alum)

↓ ↓ ↓ ↓ ↓ ↓ 50 µg E1 dose

0 3 6 9 12 15 weeks

Figure 47



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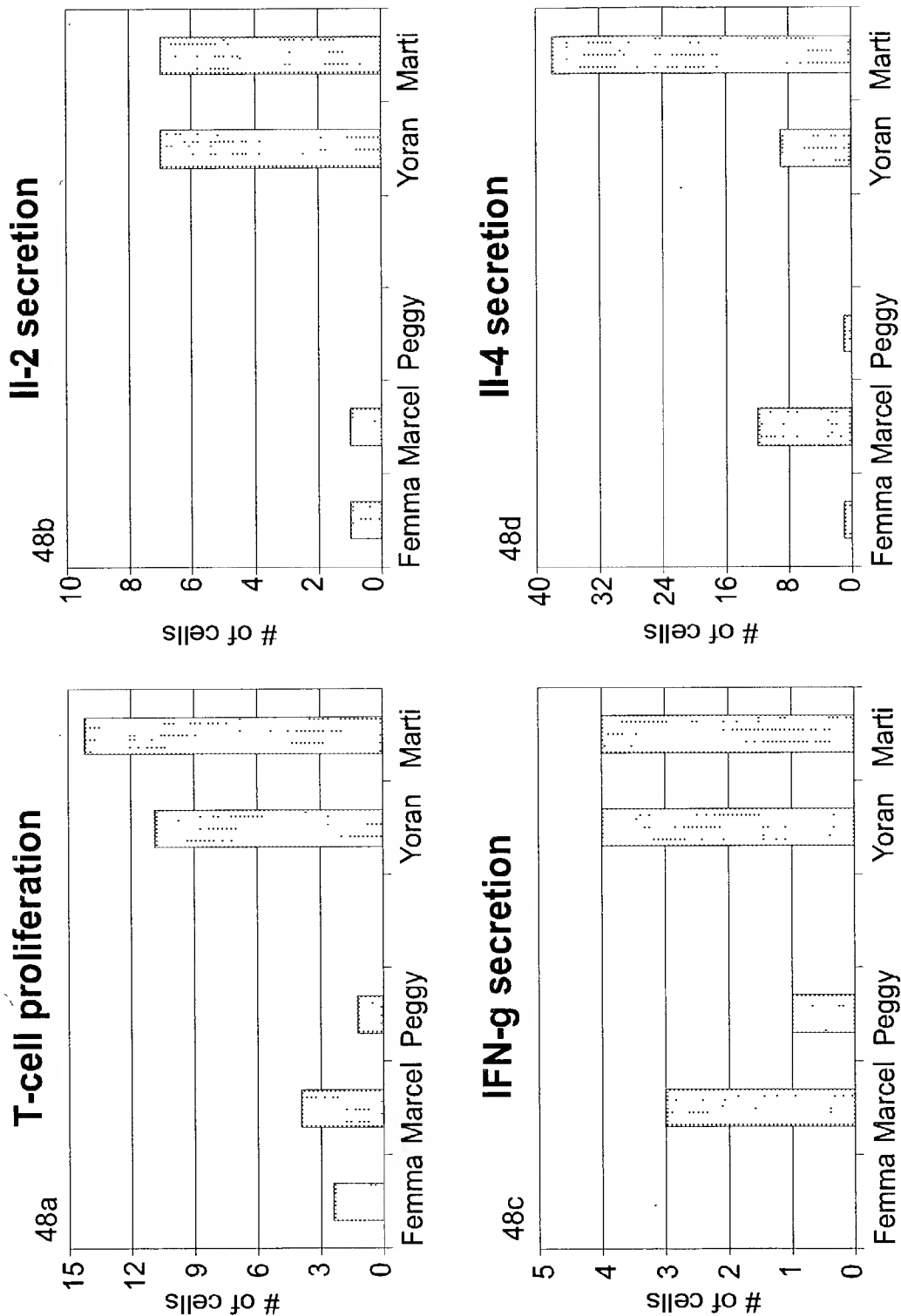
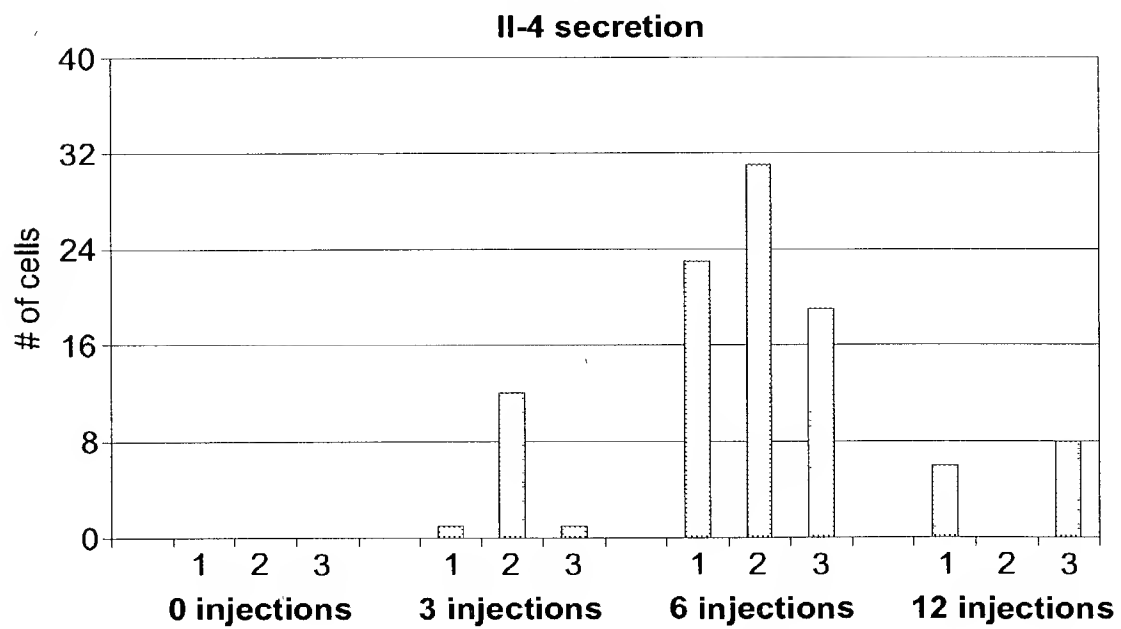
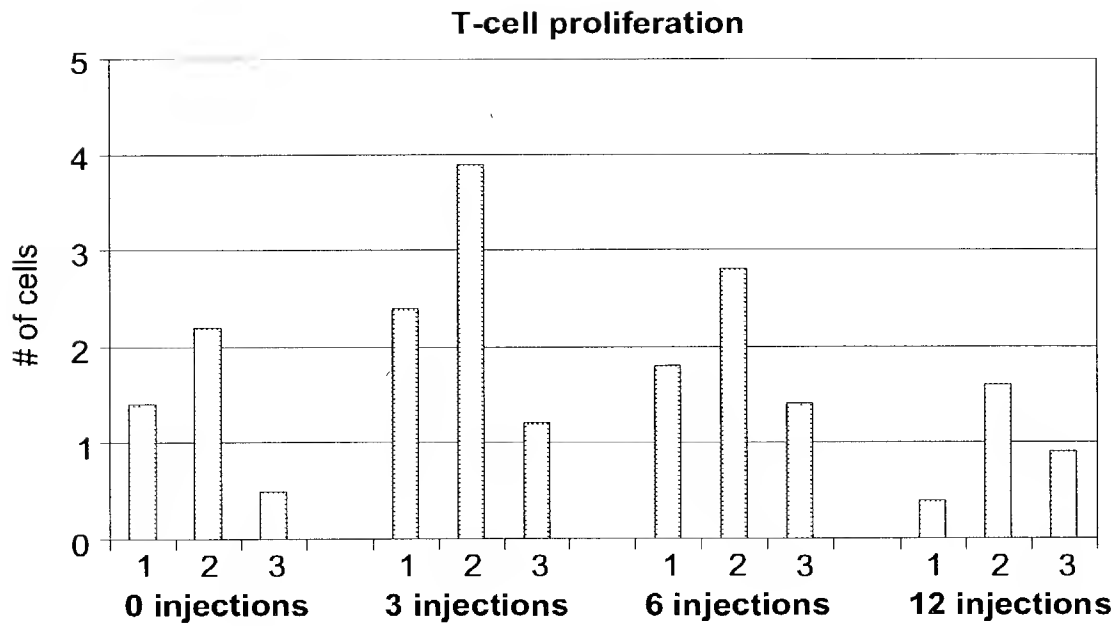


Figure 48

09995860 .074902

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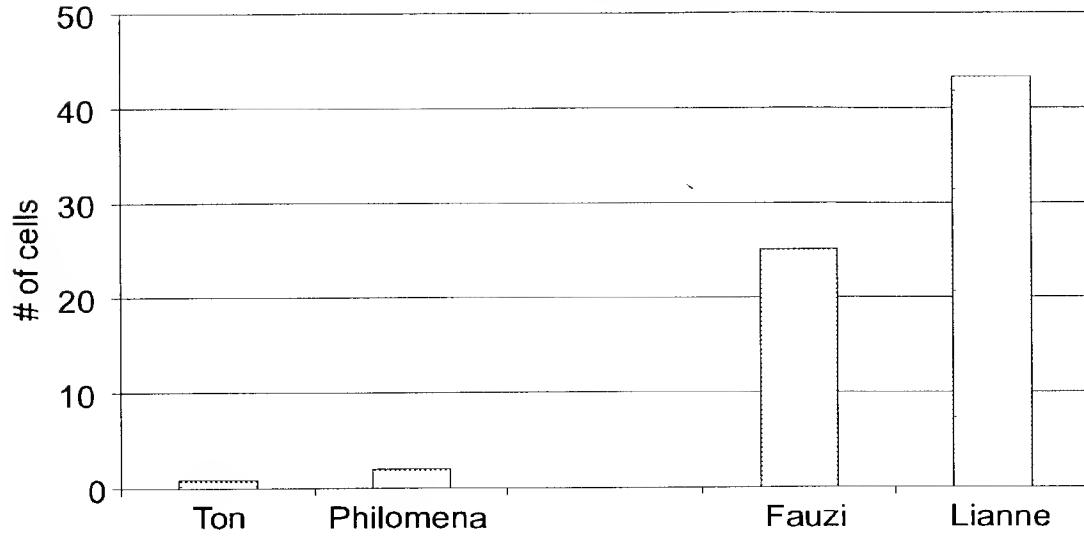
1: Femma, 2: Marcel, 3: Peggy

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T-cell proliferation



IL-2 secretion

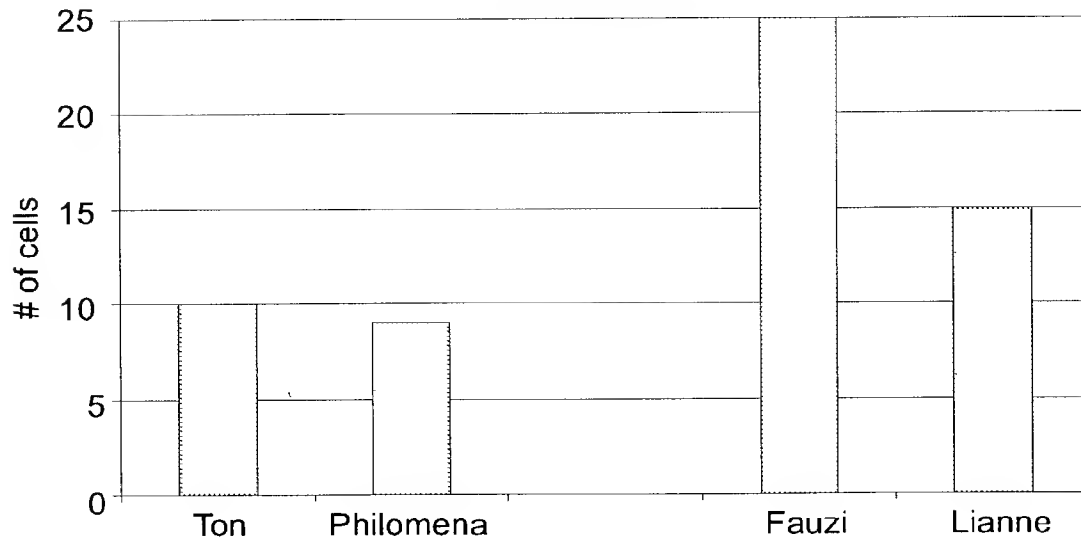


Figure 50

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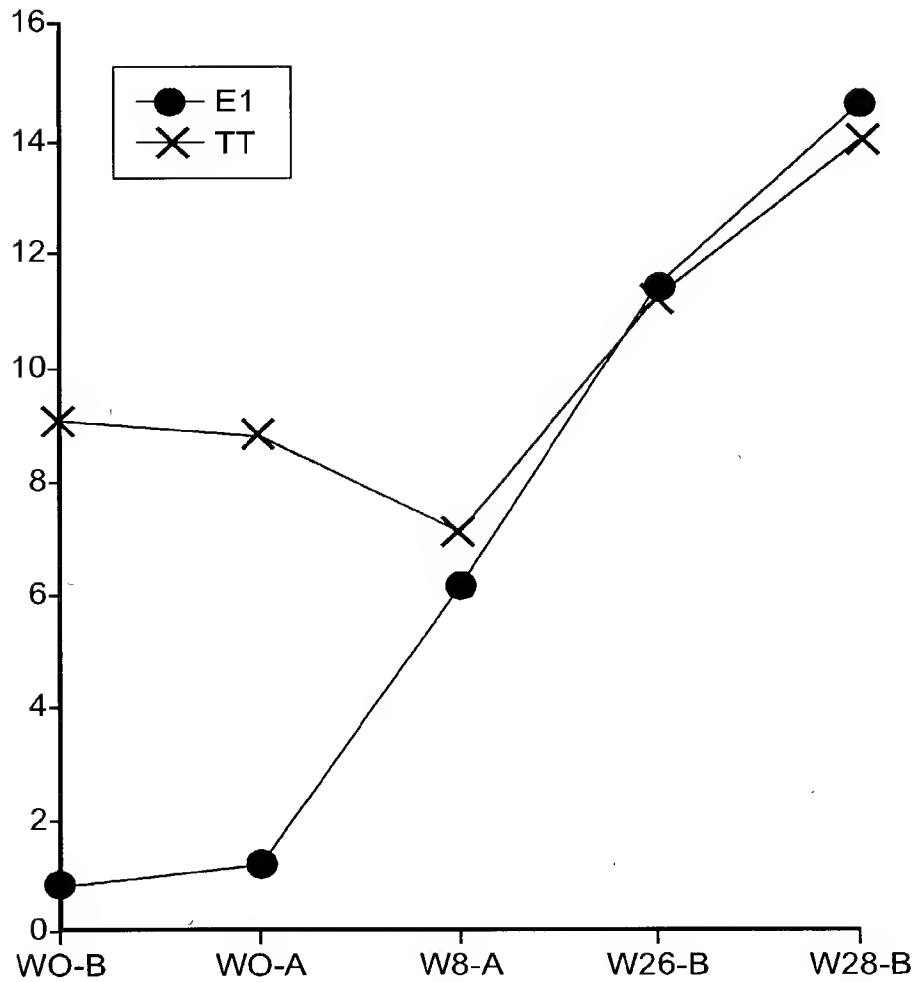


Figure 51

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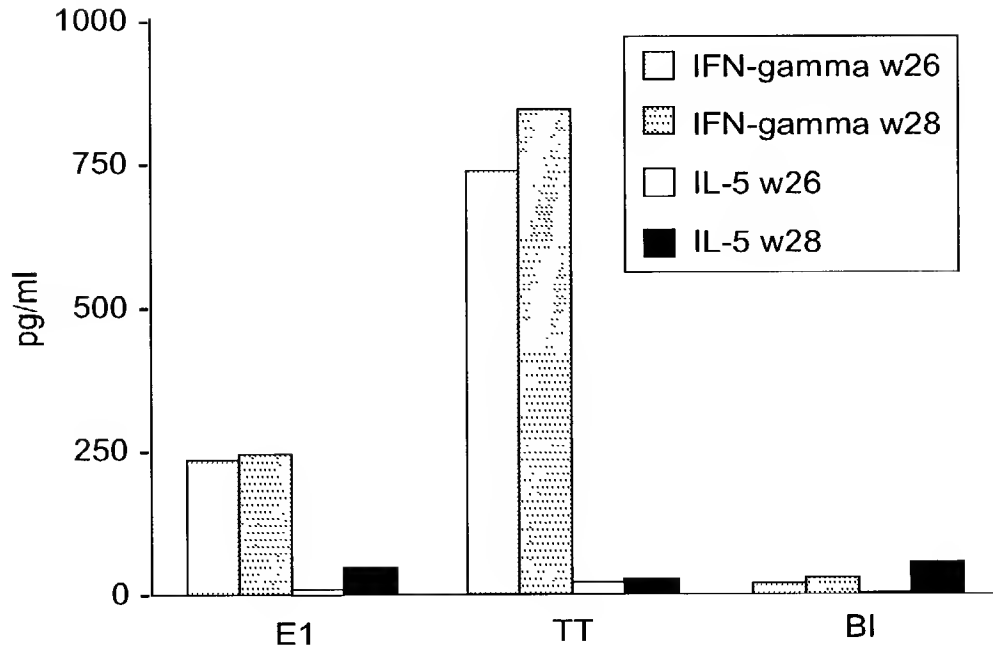


Figure 52

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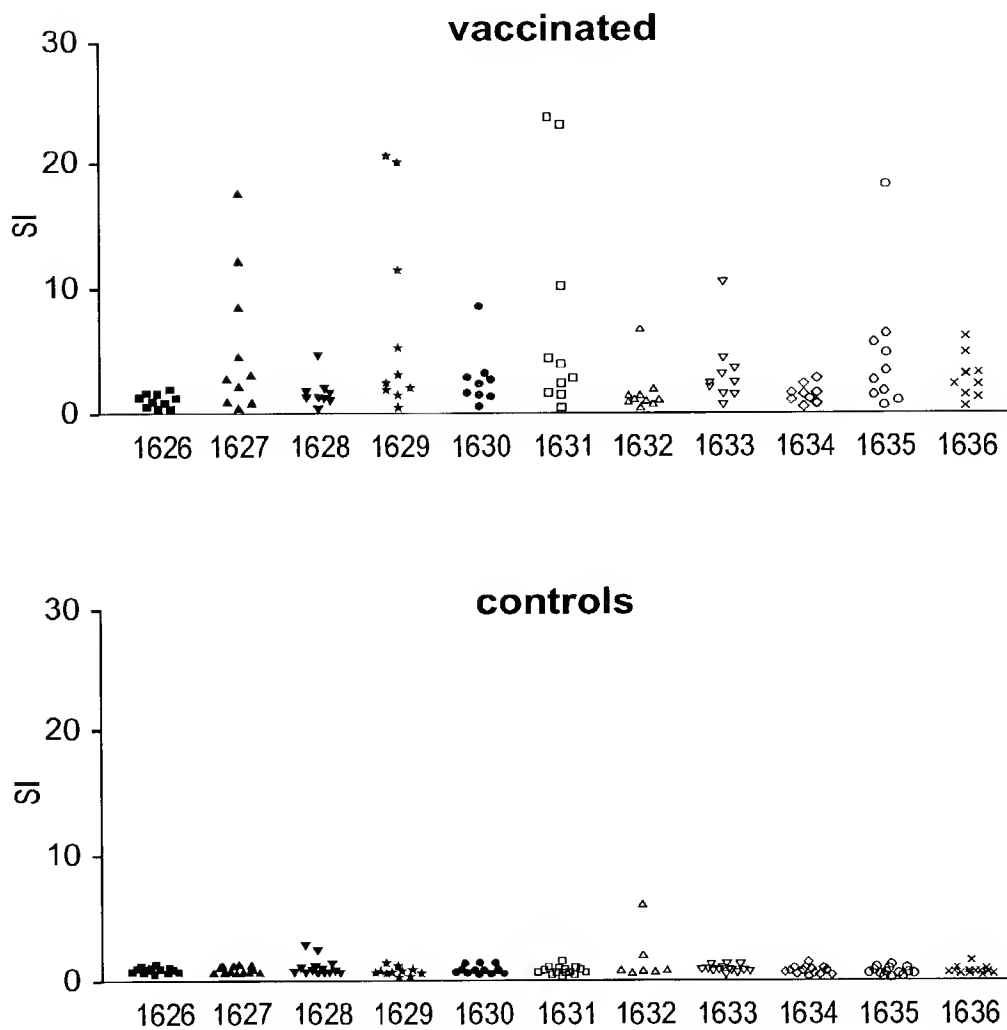


Figure 53

